

CEMİL KAYMAK.

1.8.2008 / P.tesi.

Denizli

GEOMETRİ İÇİN BEYAZ BİR SAYFA AÇIN.

Ahmet DEMİR

Bu kitapların her hakkı saklıdır. Hangi amaçla olursa olsun, testlerin tamamının veya bir kısmının Ahmet DEMİR'in yazılı izni olmadan kopya edilmesi, fotoğraflarının çekilmesi, herhangi bir yolla çoğaltılması, yayımlanması ya da kullanılması yasaktır. Bu yasağa uymayanlar gerekli cezai sorumluluğu ve soruların hazırlanmasındaki mali külfeti peşinen kabullenmiş sayılır.

2008 Ağustos

Dizgi:

Mesut ANAR

Meva KOCAARSLAN

Şükran SALTİK

Kitap için eleştirilerinizi veya taleplerinizi

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Tel: 0505 680 53 86

Sevgili Öğrenciler

Geometri dersi üniversiteye hazırlanan her öğrenci için temel derslerden biridir. Yeni sınav sistemi ile beraber bu dersin önemi daha da artmıştır.

Kitaptaki sorular, bu dersi yeni öğrenecek öğrenciler için kolaydan zora doğru hazırlanmıştır. Bir konu içerisinde bulunan tüm soruları öğrenci çözdükten sonra o konu ile ilgili tüm önyargıları kırarak diğer kaynaklardan çok daha rahat bir şekilde çalışmalarını yürütebilecektir. Böylelikle sağlam bir çalışma ile gireceği tüm sınavlarda bu dersle ilgili en yüksek puana ulaşacaktır.

Bu dersin tüm konuları birbiriyle bağlantılıdır. Konuların birbiriyle bağlantısı, soruların birbiriyle bağlantısı ile desteklenmiştir. İlk sorulardan itibaren kullanılan sayılar ve soru kalıpları sonraki konular içerisinde konularına uygun bir şekilde yerleştirilmiştir. Amacımız öğrencinin zamanla soruları daha hızlı bir şekilde çözmesini sağlamaktır.

Kitabın bir başka özelliği ise o hafta anlatılan bir konunun bitmemesi durumunda öğrencinin o konu ile ilgili çözebilecek soruları bulabilmesidir. Böylelikle öğrenciler konunun bitmesini beklemeden pratik yapma imkanı bulacaktır. Bunun sonucu olarak öğrencinin dersle kopukluğu önlenecektir.

Bu kitap, geometri dersine yeni başlayanlar için çözülmesi gereken ilk kitaptır. Bu kitapta öğrenciler, tavsiye edilen kitaplarla desteklenmelidir.

Tüm öğrencilerin disiplinli çalışmayı alışkanlık haline getirmelerini ve girecekleri tüm sınavlarda başarılı olmalarını diliyorum.

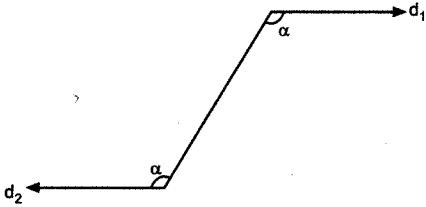
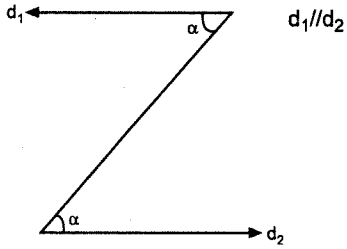
Ahmet Demir

İÇİNDEKİLER

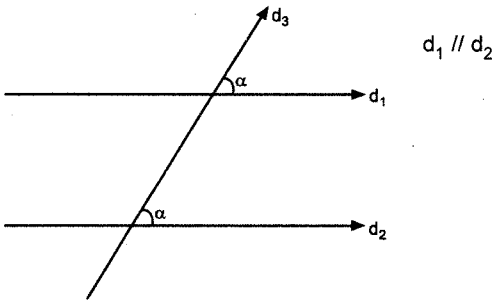
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DOĞRUDA AÇILAR

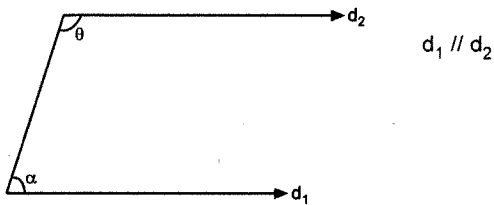
1. İç Ters Açı



2. Yöndeş Açı

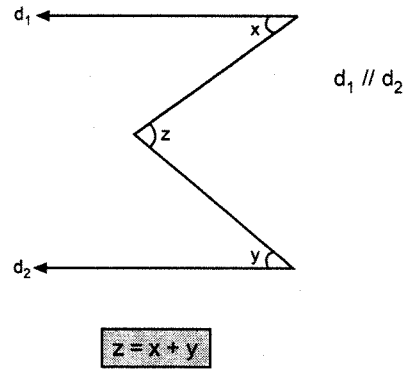


3. Karşı Durumlu Açılar



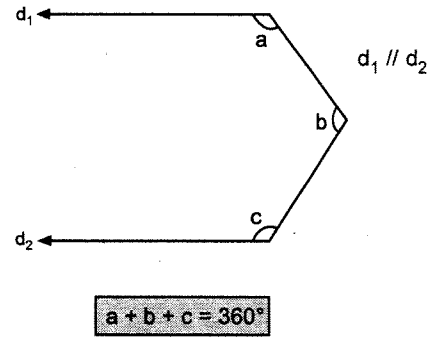
$$\alpha + \theta = 180^\circ$$

4.



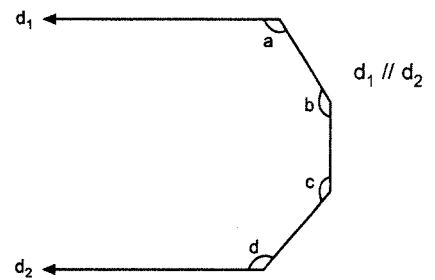
$$z = x + y$$

5.



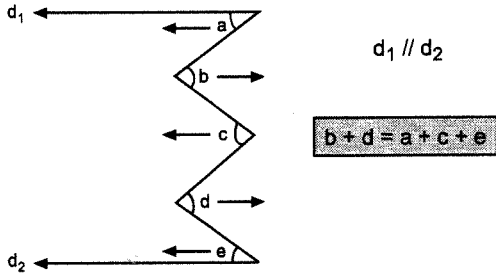
$$a + b + c = 360^\circ$$

6.



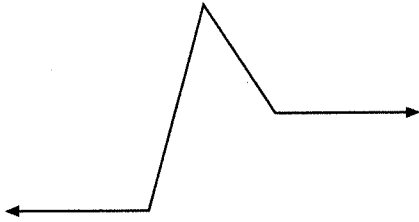
$$a + b + c + d = 540^\circ$$

7.

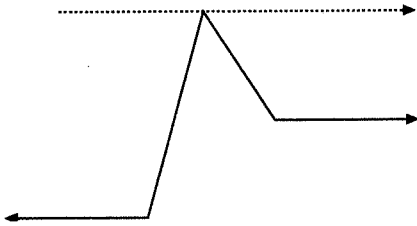


Sorunun orijinali

*

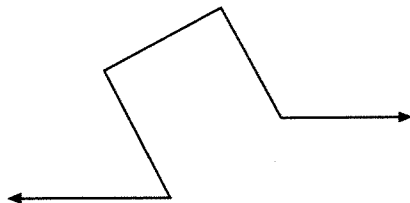


Öğrencinin yapması gerektiği

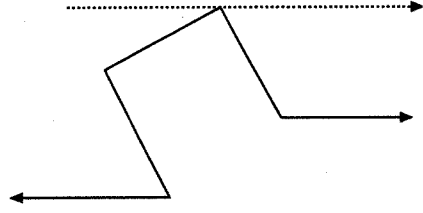


Sorunun orijinali

*

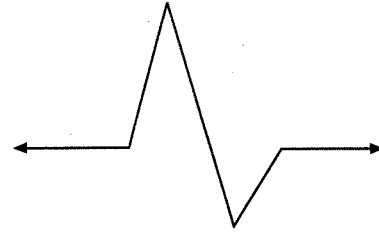


Öğrencinin yapması gerektiği

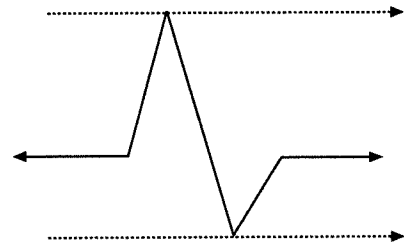


Sorunun orijinali

*

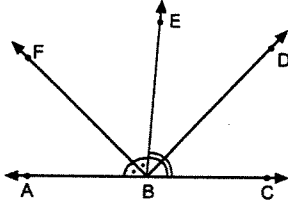


Öğrencinin yapması gerektiği



Yukarıdaki şekillerde de görüldüğü gibi köşelerden paralel çizilir ve önceki kurallardan biri elde edilme-ye çalışılır. Unutmayın doğruya açılar sorularında ya bu özellikler yardımı ile soru çözülür ya da paralel doğrular uzatılarak bu özelliklerden biri ortaya çıkarılarak sorular çözülür.

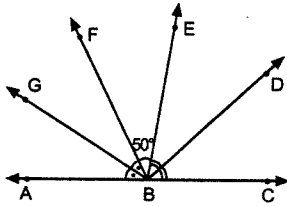
1.



$$m(\widehat{FBD}) = ?$$

Cevap: 90°

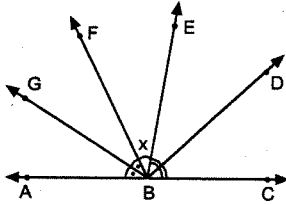
2.



$$m(\widehat{GBD}) = ?$$

Cevap: 115°

3.

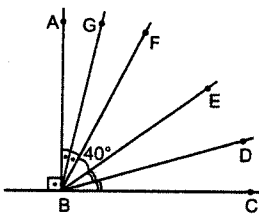


$$m(\widehat{GBD}) = 105$$

$$x = ?$$

Cevap: 30°

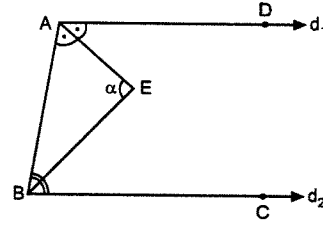
4.



$$m(\widehat{GBD}) = ?$$

Cevap: 65°

5.

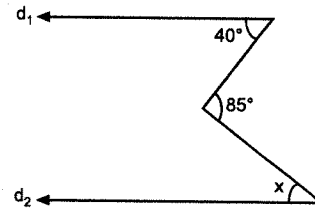


$$d_1 // d_2$$

$$\alpha = ?$$

Cevap: 90°

6.

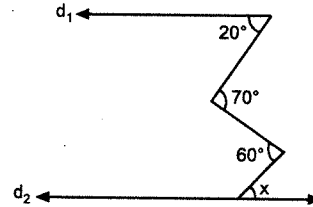


$$d_1 // d_2$$

$$x = ?$$

Cevap: 45°

7.

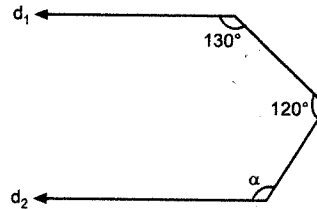


$$d_1 // d_2$$

$$x = ?$$

Cevap: 10°

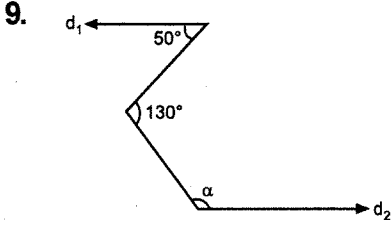
8.



$$d_1 // d_2$$

$$\alpha = ?$$

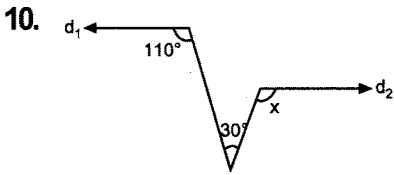
Cevap: 110°



$d_1 // d_2$

$\alpha = ?$

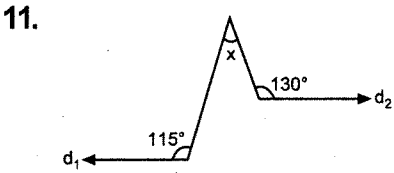
Cevap: 100°



$d_1 // d_2$

$x = ?$

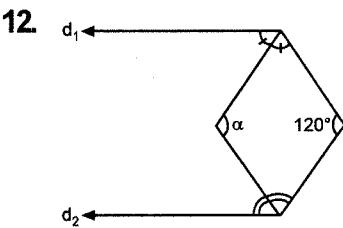
Cevap: 100°



$d_1 // d_2$

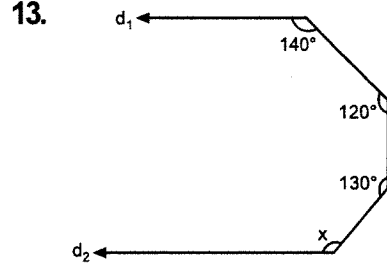
$x = ?$

Cevap: 65°



$d_1 // d_2$

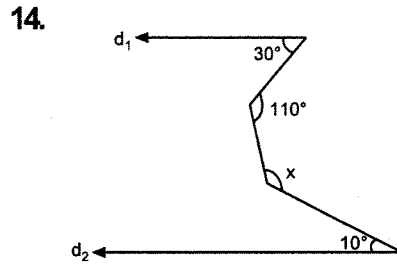
Cevap: 120°



$d_1 // d_2$

$x = ?$

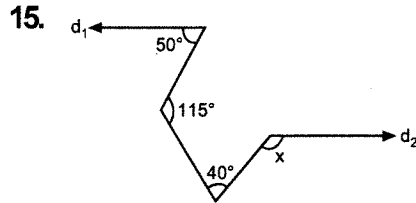
Cevap: 150°



$d_1 // d_2$

$x = ?$

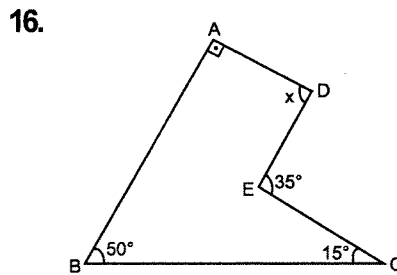
Cevap: 110°



$d_1 // d_2$

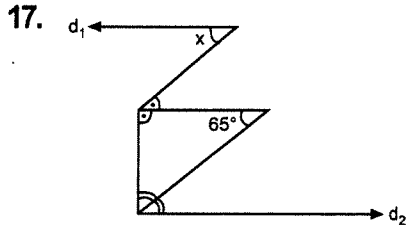
$x = ?$

Cevap: 105°



$x = ?$

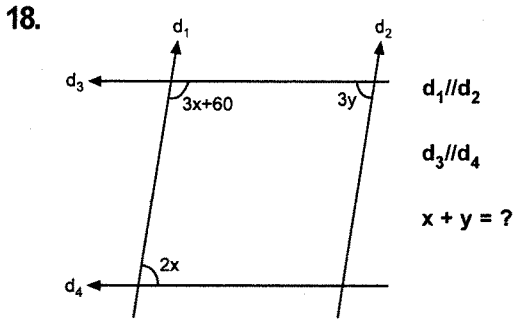
Cevap: 60°



$$d_1 // d_2$$

$$x = ?$$

Cevap: 50°

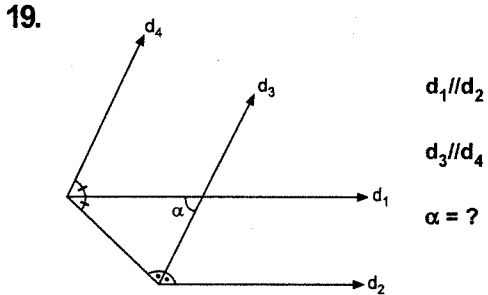


$$d_1 // d_2$$

$$d_3 // d_4$$

$$x + y = ?$$

Cevap: 40°

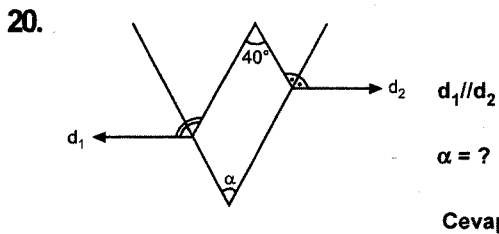


$$d_1 // d_2$$

$$d_3 // d_4$$

$$\alpha = ?$$

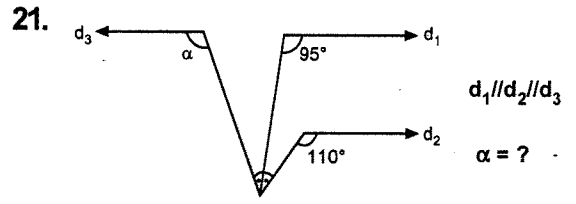
Cevap: 60°



$$d_1 // d_2$$

$$\alpha = ?$$

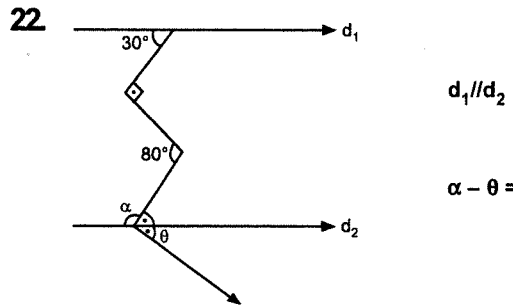
Cevap: 70°



$$d_1 // d_2 // d_3$$

$$\alpha = ?$$

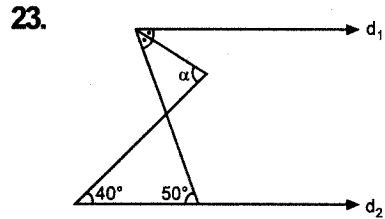
Cevap: 100°



$$d_1 // d_2$$

$$\alpha - \theta = ?$$

Cevap: 140°



$$d_1 // d_2$$

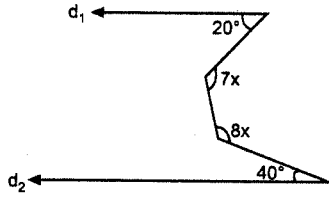
$$\alpha = ?$$

Cevap: 65°

24. Herhangi bir açının tümlerinin bütünlerine oranı $\frac{2}{7}$ ise bu açı kaç derecedir?

Cevap: 54°

25.

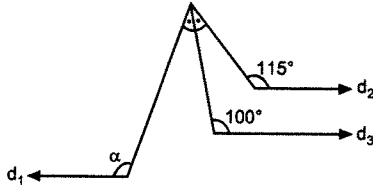


$$d_1 // d_2$$

$$x = ?$$

Cevap: 16°

26.

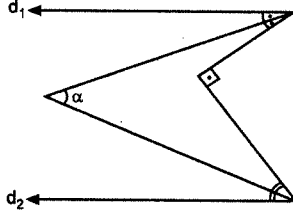


$$d_1 // d_2 // d_3$$

$$\alpha = ?$$

Cevap: 95°

27.

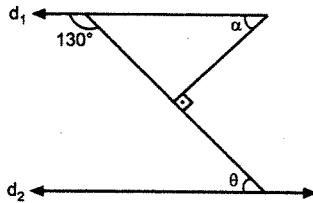


$$d_1 // d_2$$

$$\alpha = ?$$

Cevap: 45°

28.

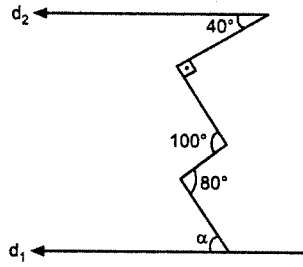


$$d_1 // d_2$$

$$\theta - \alpha = ?$$

Cevap: 10°

29.

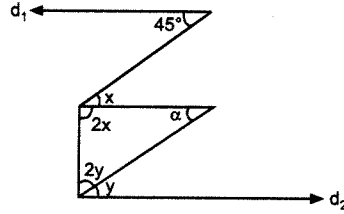


$$d_1 // d_2$$

$$\alpha = ?$$

Cevap: 30°

30.

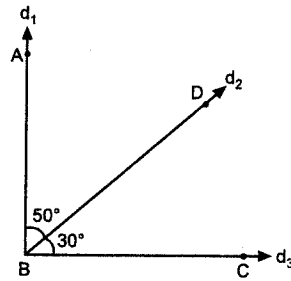


$$d_1 // d_2$$

$$\alpha = ?$$

Cevap: 30°

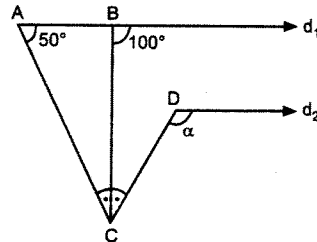
31.



$m(\widehat{ABD})$ ile
 $m(\widehat{ABC})$ nin
açıortayları
arasındaki
açı kaç
derecedir?

Cevap: 15°

32.



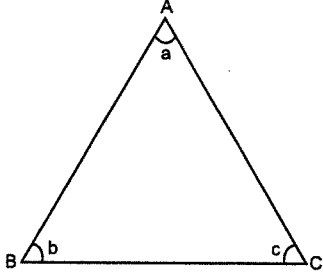
$$d_1 // d_2$$

$$\alpha = ?$$

Cevap: 150°

ÜÇGENDE AÇILAR

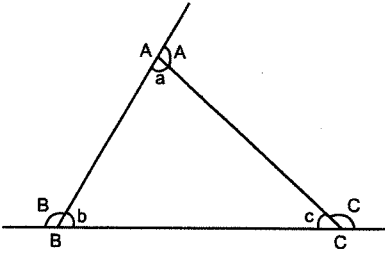
1.



$$a + b + c = 180^\circ$$

Üçgenin iç açıları toplamı 180° dir.

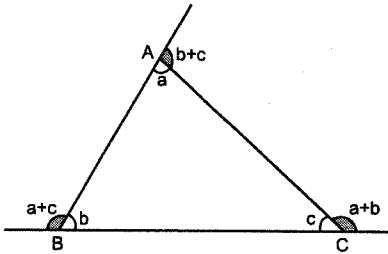
2.



Üçgenin dış açıları toplamı 360° dir.

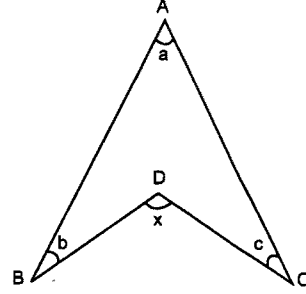
$$A + B + C = 360^\circ$$

3.



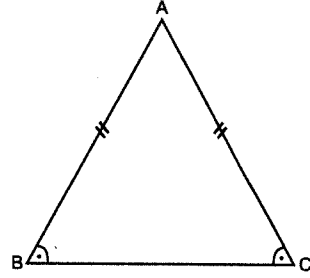
Herhangi bir dış açı, kendisine komşu olmayan iki iç açının toplamına eşittir.

4.



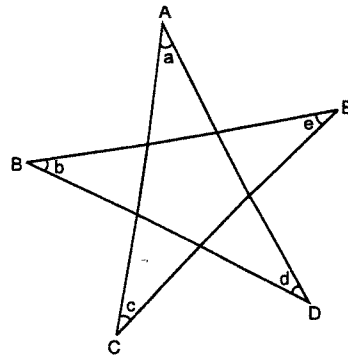
$$x = a + b + c$$

5.



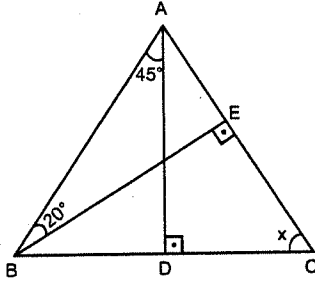
$$|AB| = |AC| \Rightarrow m(\widehat{B}) = m(\widehat{C})$$

6.



$$a + b + c + d + e = 180^\circ \text{ dir.}$$

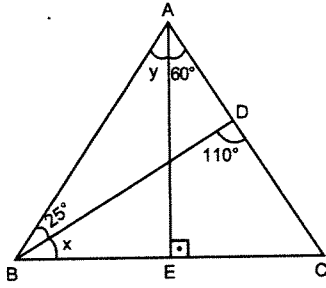
1.



$x = ?$

Cevap: 65°

2.

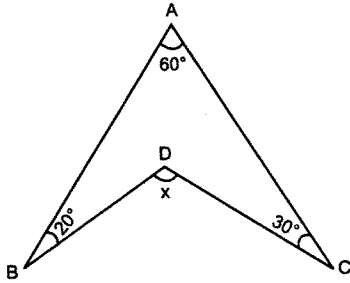


$$x = ?$$

$$y = ?$$

Cevap: $x = 40^\circ$
 $y = 25^\circ$

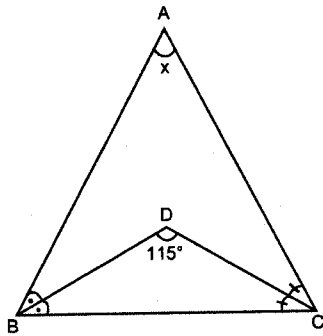
3.



$x = ?$

Cevap: 110°

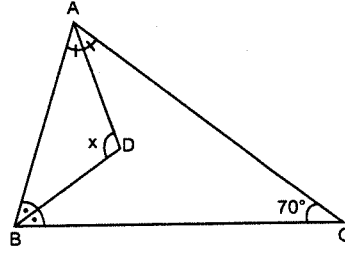
4.



$x = ?$

Cevap: 50°

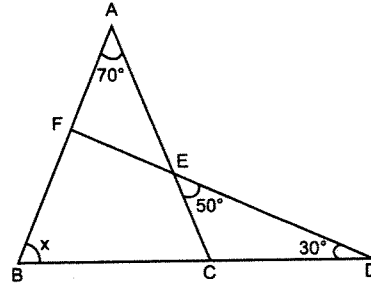
5.



$x = ?$

Cevap: 125°

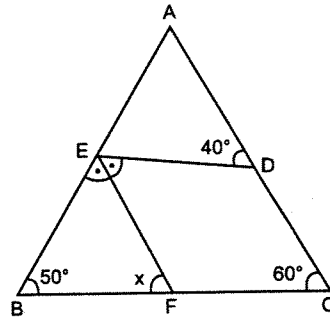
6.



$x = ?$

Cevap: 30°

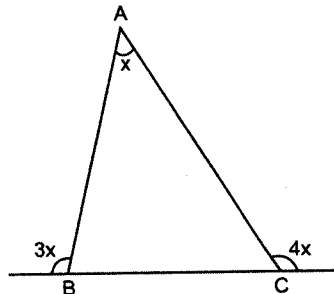
7.



$x = ?$

Cevap: 75°

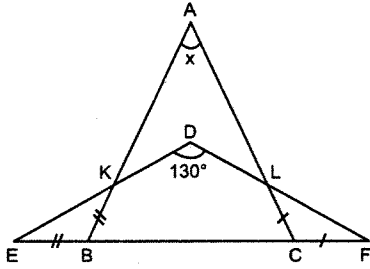
8.



$x = ?$

Cevap: 30°

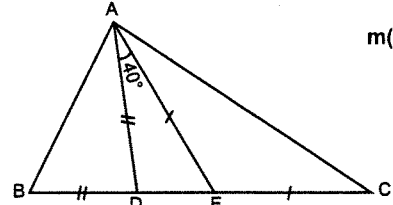
9.



$x = ?$

Cevap: 80°

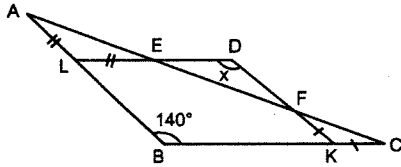
13.



$m(\widehat{BAC}) = ?$

Cevap: 110°

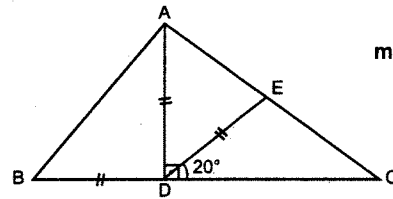
10.



$x = ?$

Cevap: 140°

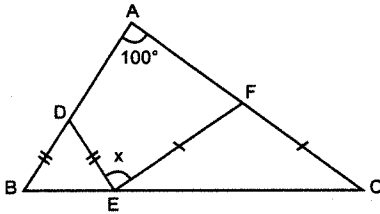
14.



$m(\widehat{BAC}) = ?$

Cevap: 100°

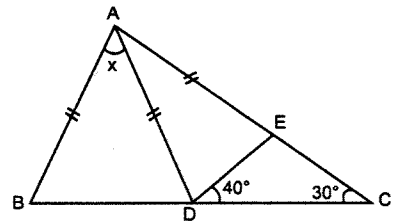
11.



$x = ?$

Cevap: 100°

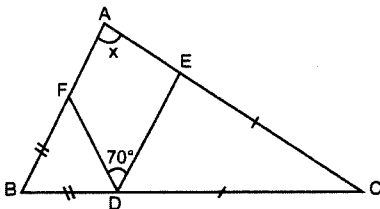
15.



$x = ?$

Cevap: 40°

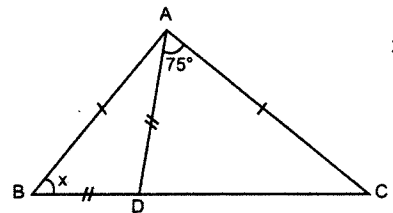
12.



$x = ?$

Cevap: 40°

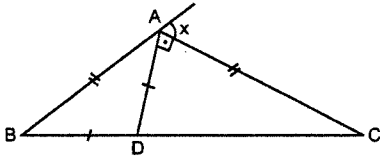
16.



$x = ?$

Cevap: 35°

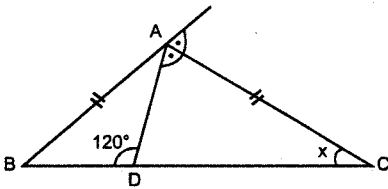
17.



$x = ?$

Cevap: 60°

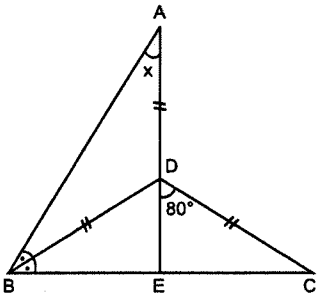
18.



$x = ?$

Cevap: 40°

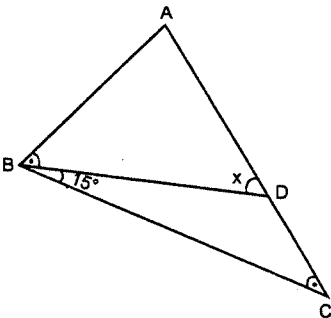
19.



$x = ?$

Cevap: 25°

20.

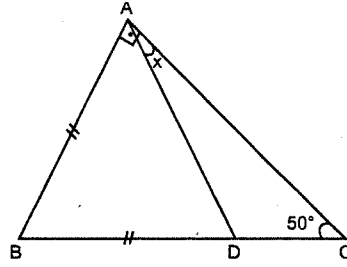


$|AC| = |BC|$

$x = ?$

Cevap: 65°

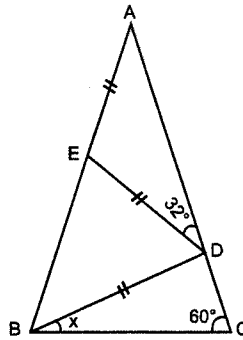
21.



$x = ?$

Cevap: 20°

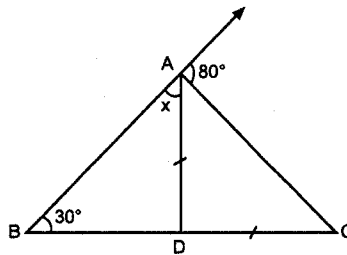
22.



$x = ?$

Cevap: 24°

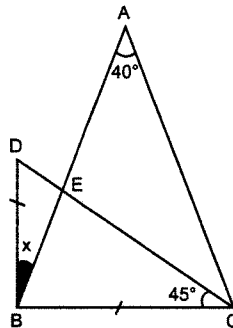
23.



$x = ?$

Cevap: 50°

24.

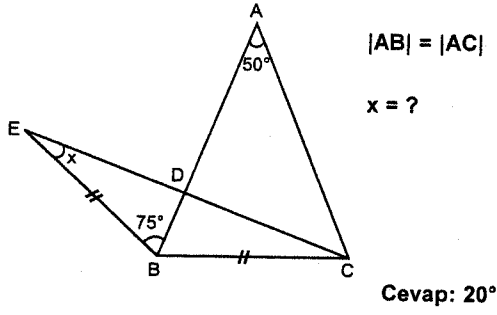


$|AC| = |AB|$

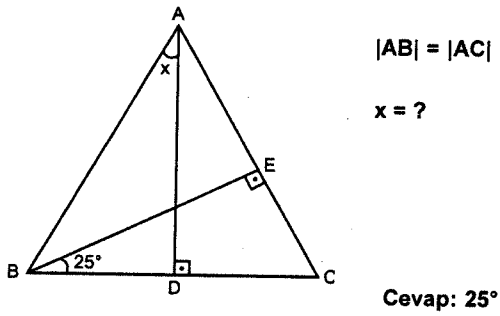
$x = ?$

Cevap: 20°

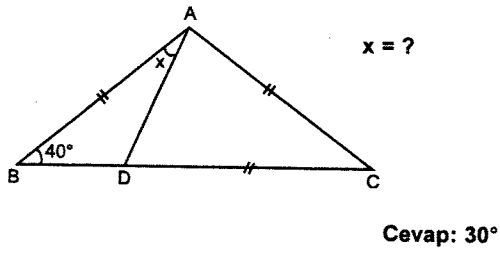
25.



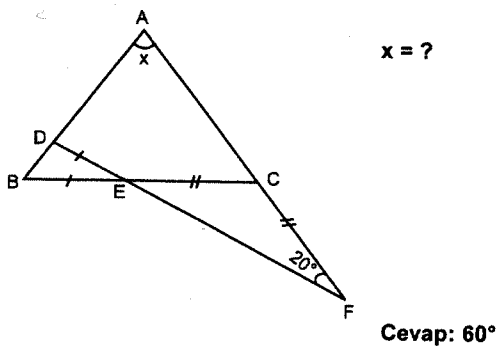
26.



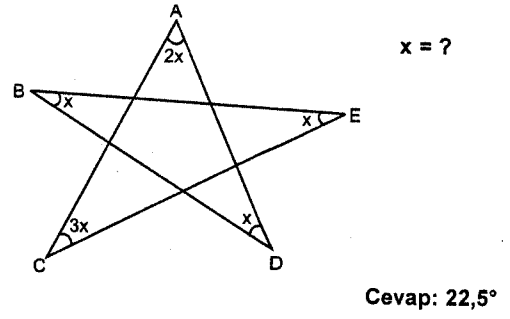
27.



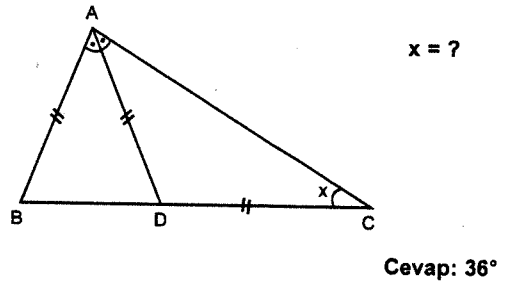
28.



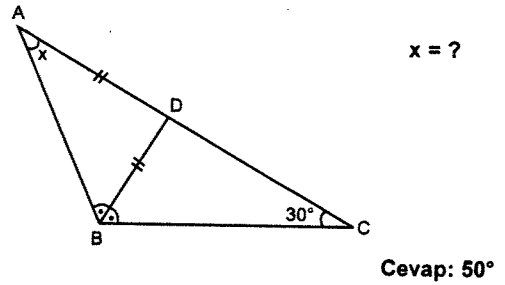
29.



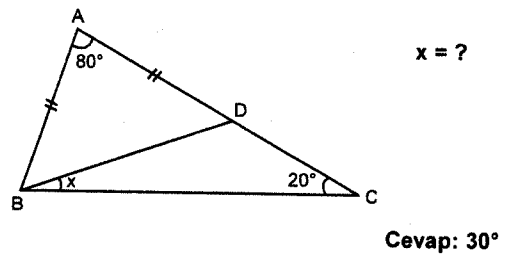
30.



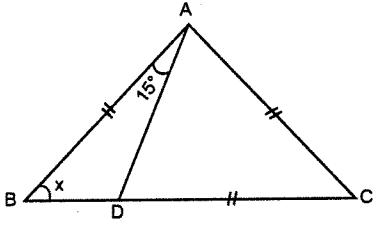
31.



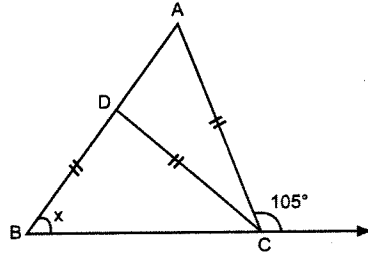
32.



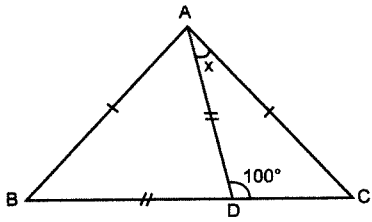
33.

 $x = ?$ Cevap: 50°

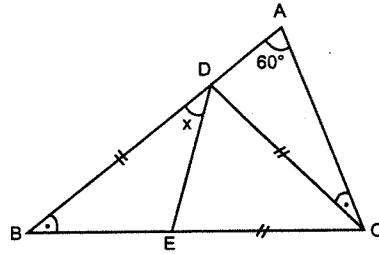
37.

 $x = ?$ Cevap: 35°

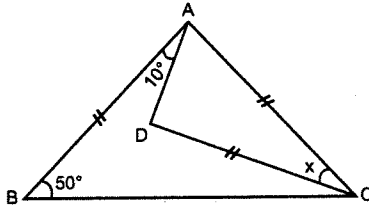
34.

 $x = ?$ Cevap: 30°

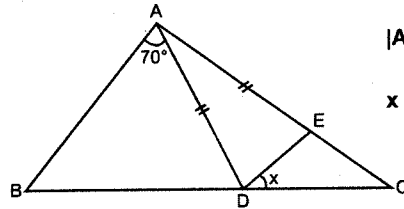
38.

 $x = ?$ Cevap: 30°

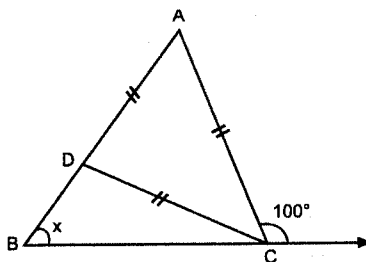
35.

 $x = ?$ Cevap: 40°

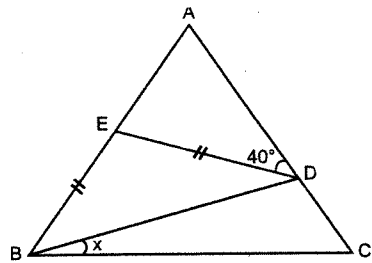
39.

 $|AB| = |AC|$ $x = ?$ Cevap: 35°

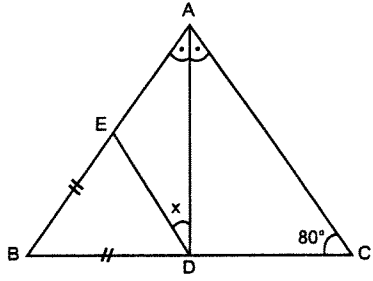
36.

 $x = ?$ Cevap: 40°

40.

 $|AB| = |AC|$ $x = ?$ Cevap: 20°

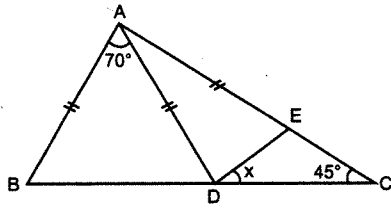
41.



$x = ?$

Cevap: 40°

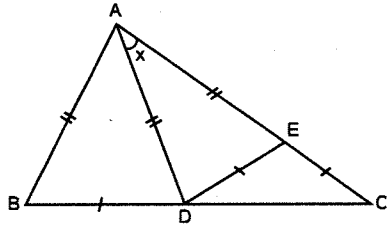
42.



$x = ?$

Cevap: 40°

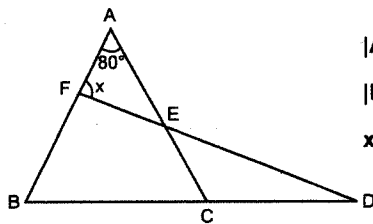
43.



$x = ?$

Cevap: 36°

44.



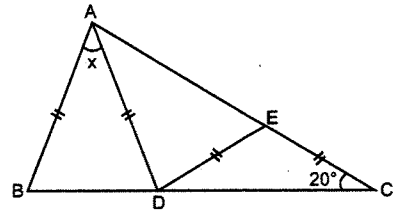
$|AB| = |AC|$

$|EC| = |CD|$

$x = ?$

Cevap: 75°

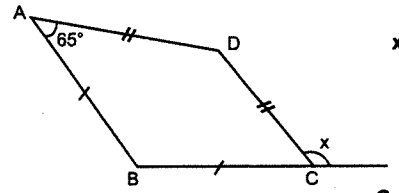
45.



$x = ?$

Cevap: 60°

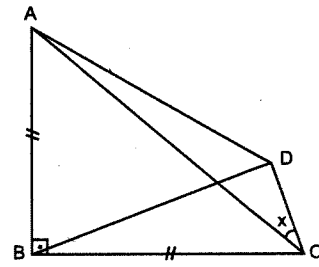
46.



$x = ?$

Cevap: 115°

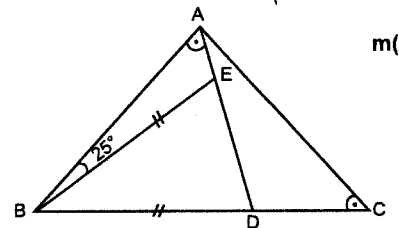
47.

ABD eşkenar
üçgen

$x = ?$

Cevap: 30°

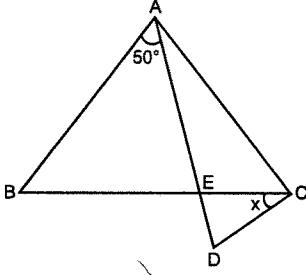
48.



$m(\widehat{DAC}) = ?$

Cevap: 25°

49.

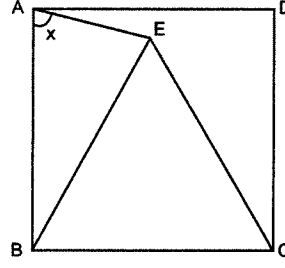


$$|AB| = |AC| = |AD|$$

$$x = ?$$

Cevap: 25°

53.

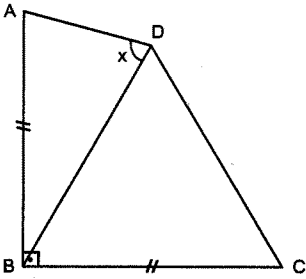


ABCD kare,
BEC eşkenar
üçgen

$$x = ?$$

Cevap: 75°

50.

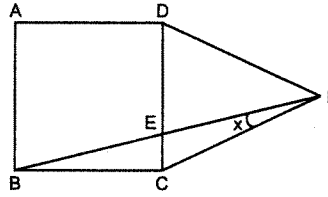


DBC eşkenar
üçgen

$$x = ?$$

Cevap: 75°

54.

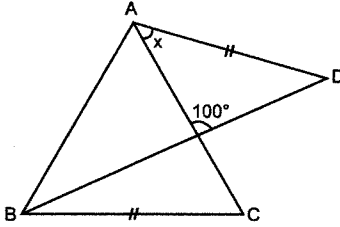


ABCD kare,
DCF eşkenar
üçgen

$$x = ?$$

Cevap: 15°

51.

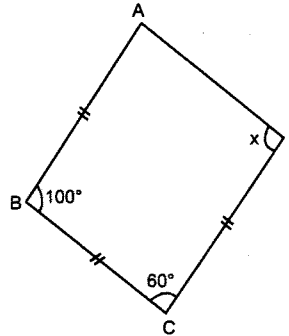


ABC eşkenar
üçgen

$$x = ?$$

Cevap: 40°

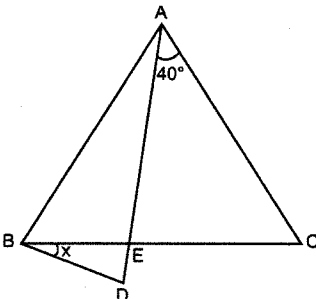
55.



$$x = ?$$

Cevap: 130°

52.

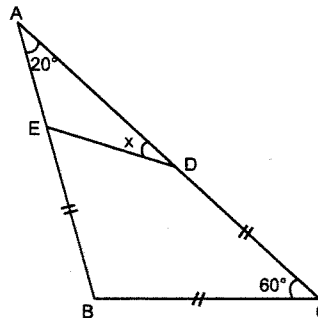


$|AC| = |AD|$
ABC eşkenar
üçgen

$$x = ?$$

Cevap: 20°

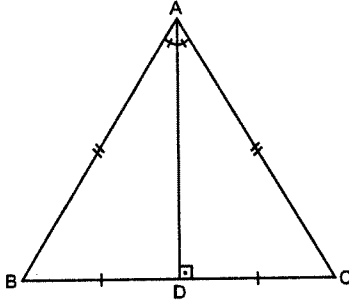
56.



$$x = ?$$

Cevap: 50°

İKİZKENAR ÜÇGEN

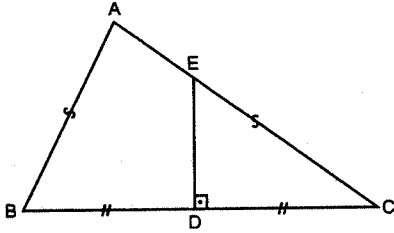


İkizkenar üçgende yükseklik, açıortay ve kenarortay birbirine eşittir.

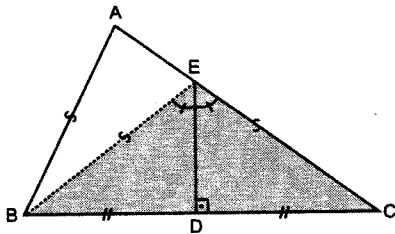
Soruda, ikizkenarlık
açıortaylık
yükseklik
kenarortaylık

bu dört bilgidenden herhangi ikisi veya ikisini çağrıştıran şekiller varsa yukarıdaki şekile tamamlanır.

1.

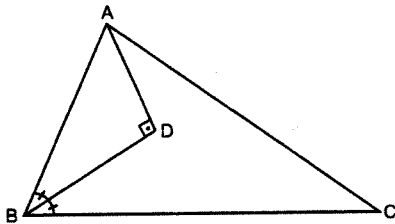


Soruda böyle
verilirse

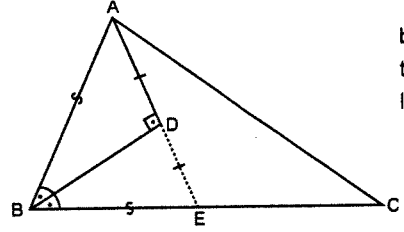


Böyle tamamlanır.

2.

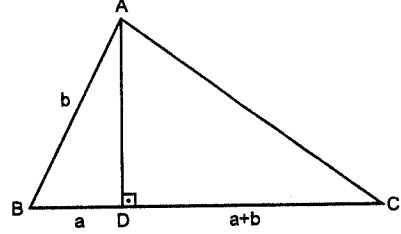


Böyle verilirse

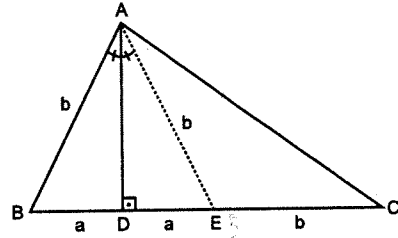


böyle tamamlanır.

3.

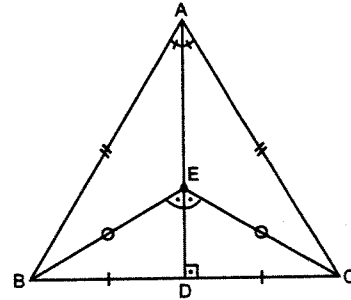


Soruda böyle verilirse

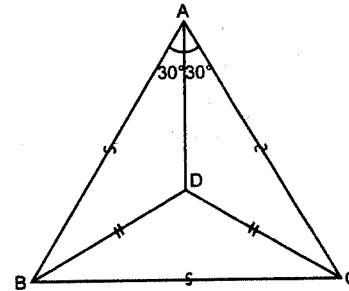


Böyle tamamlanır.

*

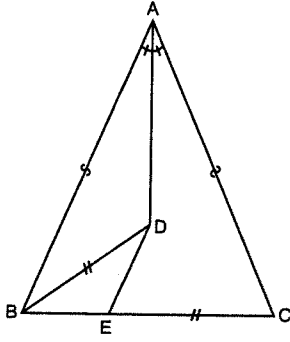


[AD] de bir nokta alınır. E den B ve C ye çizgiler uzatılırsa $|EB| = |EC|$ olur.

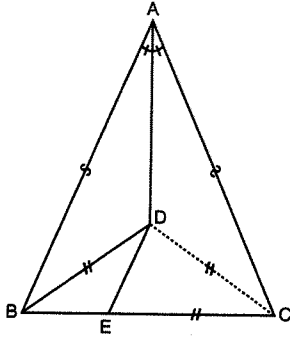


ABC eşkenar üçgen ve $|BD| = |DC|$ ise

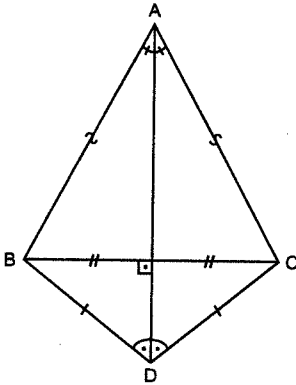
$m(\widehat{BAD}) = m(\widehat{DAC}) = 30^\circ$ olur.



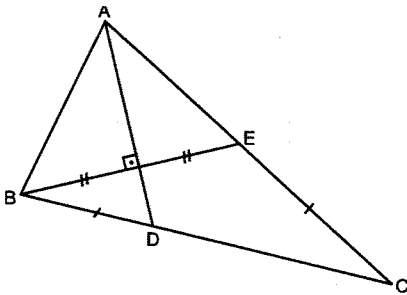
Şekil böyle
verilirse



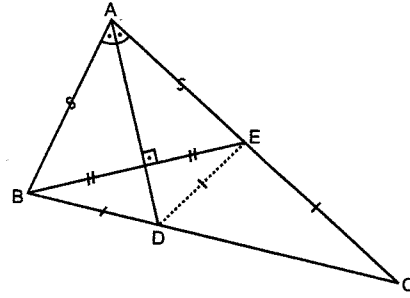
Böyle
tamamlanır.



*

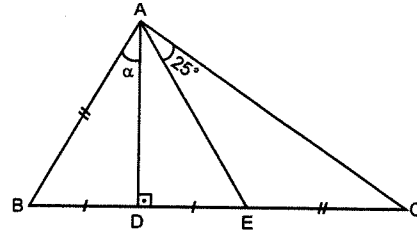


Şekil
böyle
verilirse



Böyle
yapılır.

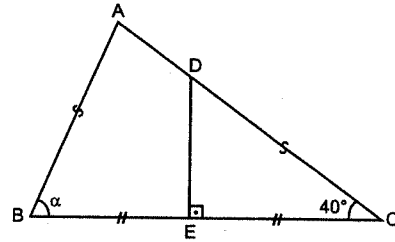
Örnek:



$\alpha = ?$

Cevap: 40°

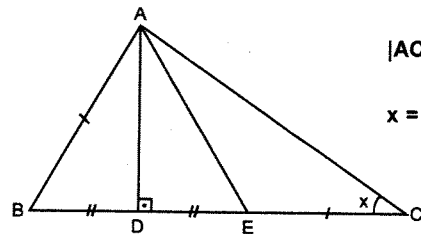
Örnek:



$\alpha = ?$

Cevap: 60°

Örnek:

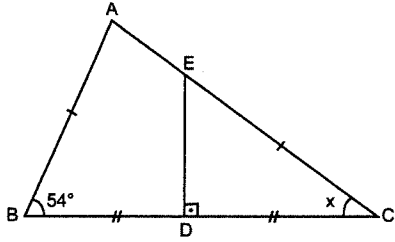


$|AC| = |BC|$

$x = ?$

Cevap: 36°

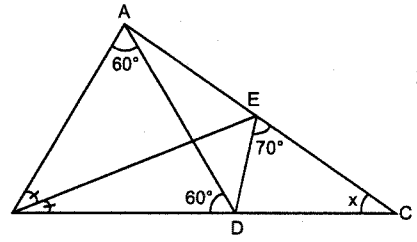
Örnek:



$x = ?$

Cevap: 42°

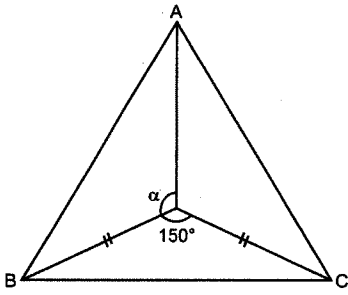
Örnek:



$x = ?$

Cevap: 25°

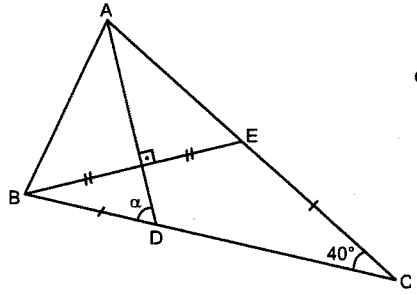
Örnek:

ABC
eşkenar

$\alpha = ?$

Cevap: 105°

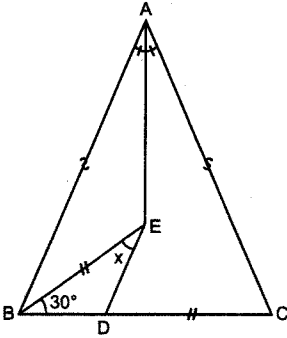
Örnek:



$\alpha = ?$

Cevap: 70°

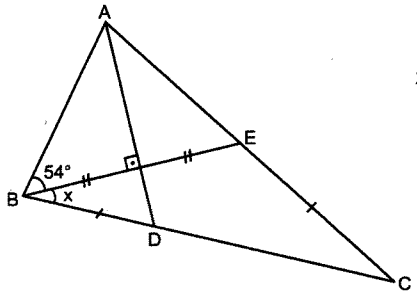
Örnek:



$x = ?$

Cevap: 45°

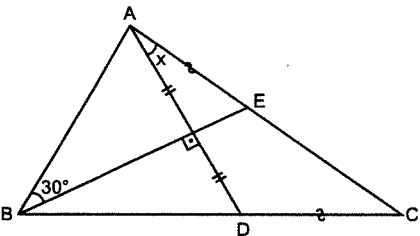
Örnek:



$x = ?$

Cevap: 18°

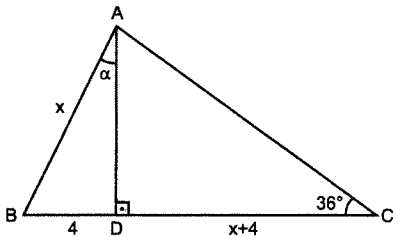
Örnek:



$x = ?$

Cevap: 20°

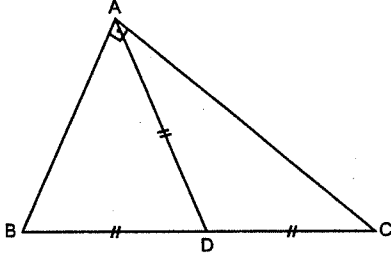
Örnek:



$\alpha = ?$

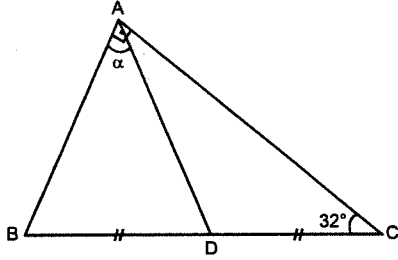
Cevap: 18°

MUHTEŞEM ÜÇLÜ

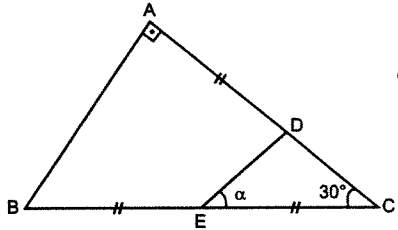


Hipotenüse ait kenarortay ayırdığı parçalardan birine eşittir.

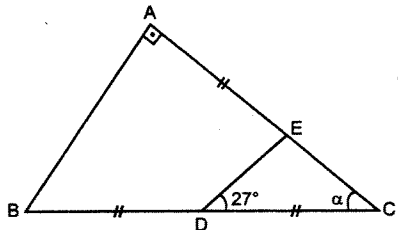
Örnek:

 $\alpha = ?$ Cevap: 58°

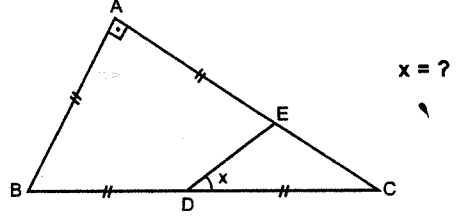
Örnek:

 $\alpha = ?$ Cevap: 45°

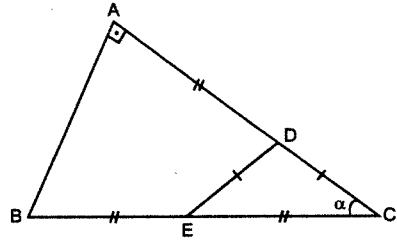
Örnek:

 $\alpha = ?$ Cevap: 42°

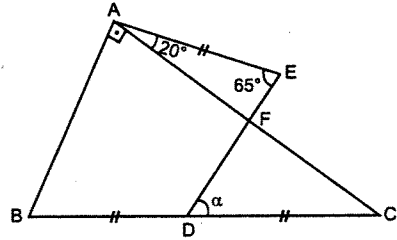
Örnek:

 $x = ?$ Cevap: 45°

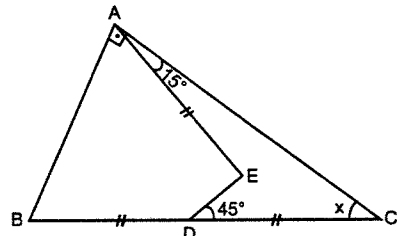
Örnek:

 $\alpha = ?$ Cevap: 36°

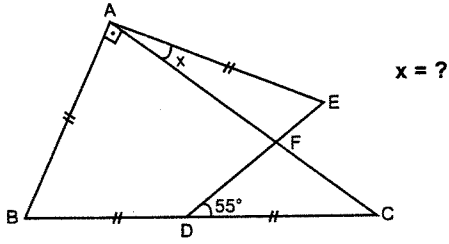
Örnek:

 $\alpha = ?$ Cevap: 55°

Örnek:

 $x = ?$ Cevap: 25°

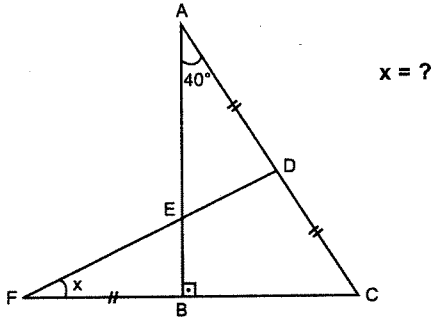
Örnek:



$x = ?$

Cevap: 20°

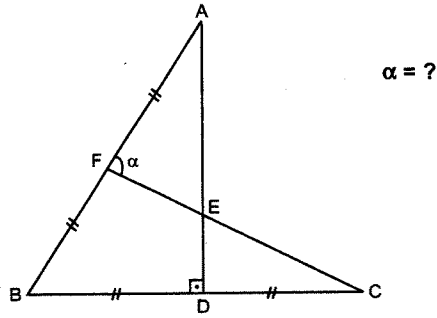
Örnek:



$x = ?$

Cevap: 25°

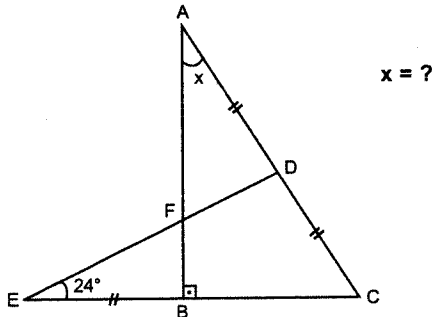
Örnek:



$\alpha = ?$

Cevap: 90°

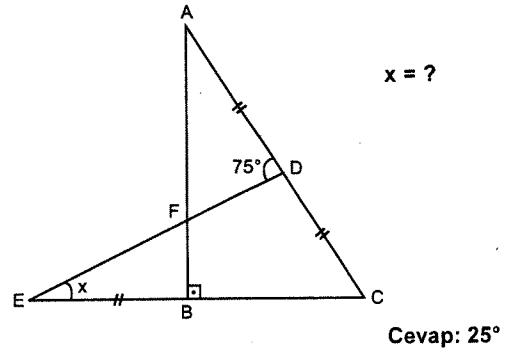
Örnek:



$x = ?$

Cevap: 42°

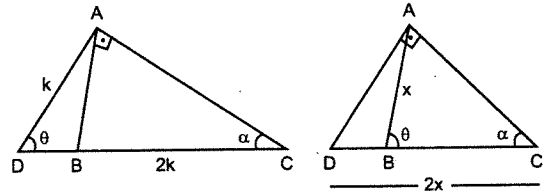
Örnek:



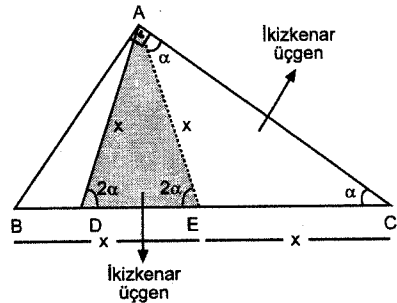
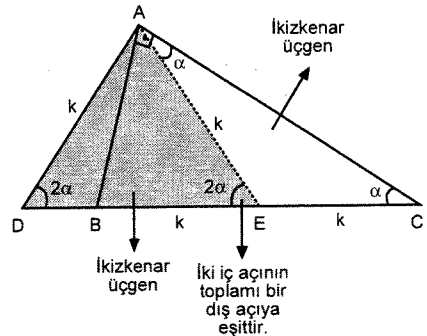
$x = ?$

Cevap: 25°

NOT:

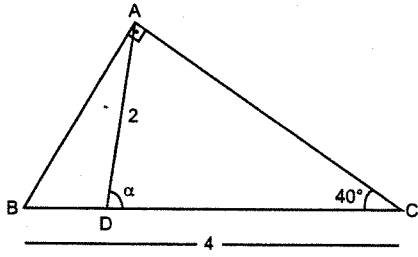


Yukarıdaki iki şekilde 90° nin içinden geçen çizgi veya 90° nin yanındaki çizgi hipotenüsün yarısına eşittir. Bu sorularda hipotenüse ait kenarortay çizilir. Yani muhteşem üçlü oluşturulur.



şeklinde yapılır.

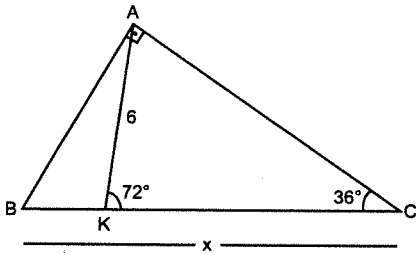
Örnek:



$$\alpha = ?$$

Cevap: 80°

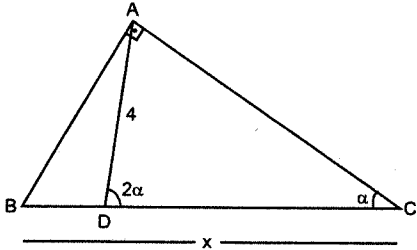
Örnek:



$$x = ?$$

Cevap: 12

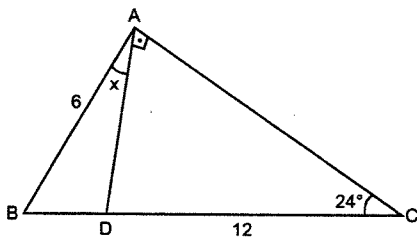
Örnek:



$$x = ?$$

Cevap: 8

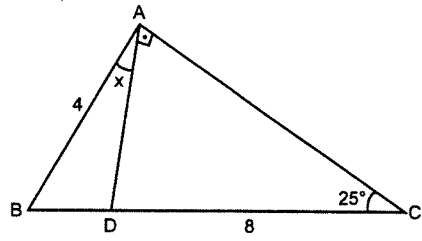
Örnek:



$$x = ?$$

Cevap: 18°

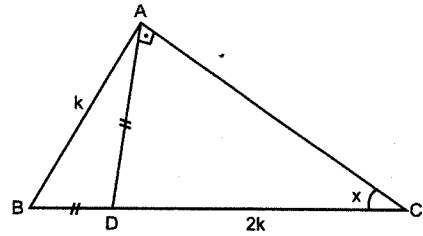
Örnek:



$$x = ?$$

Cevap: 15°

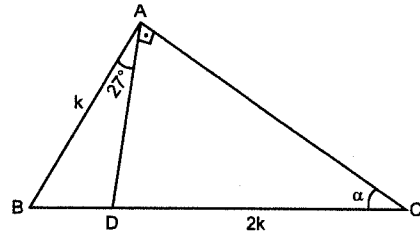
Örnek:



$$x = ?$$

Cevap: 18°

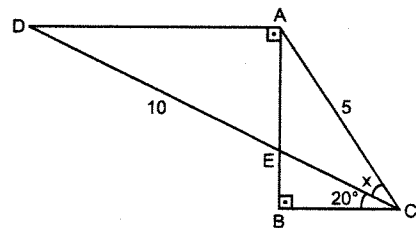
Örnek:



$$x = ?$$

Cevap: 21°

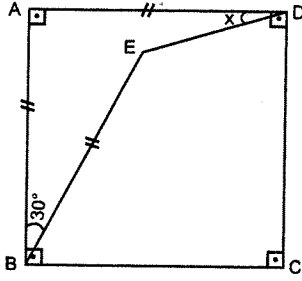
Örnek:



$$x = ?$$

Cevap: 40°

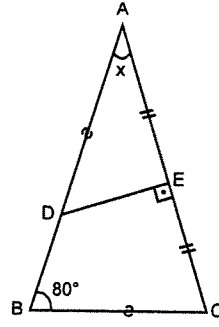
57.



$x = ?$

Cevap: 15°

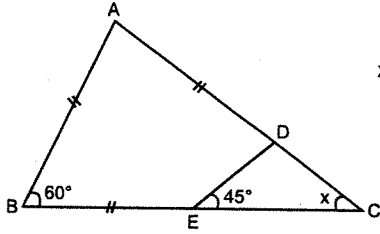
61.



$x = ?$

Cevap: 40°

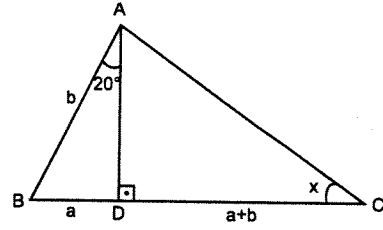
58.



$x = ?$

Cevap: 30°

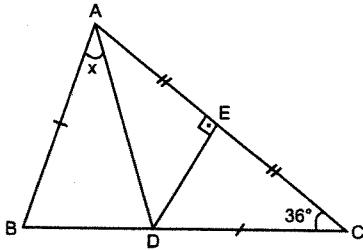
62.



$x = ?$

Cevap: 35°

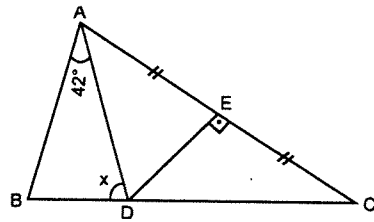
59.



$x = ?$

Cevap: 36°

63.

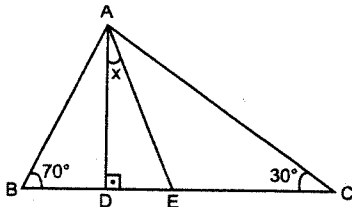


$|AC| = |BC|$

$x = ?$

Cevap: 64°

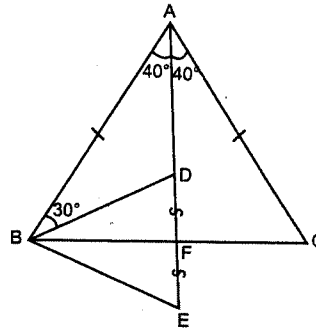
60.

 $|AE|$ açıortay

$x = ?$

Cevap: 20°

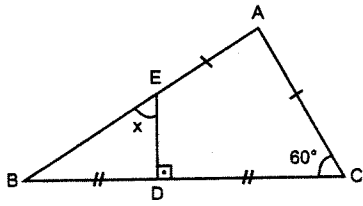
64.



$m(\widehat{AEB}) = ?$

Cevap: 70°

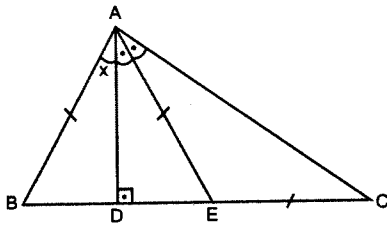
65.



$x = ?$

Cevap: 70°

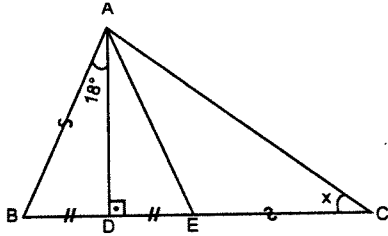
66.



$x = ?$

Cevap: 30°

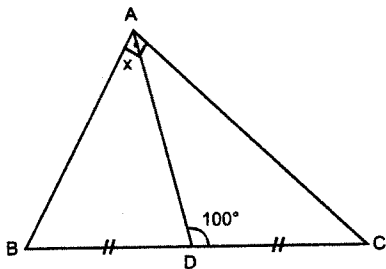
67.



$x = ?$

Cevap: 36°

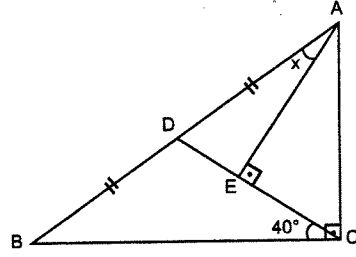
68.



$x = ?$

Cevap: 50°

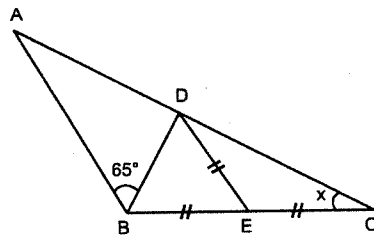
69.



$x = ?$

Cevap: 10°

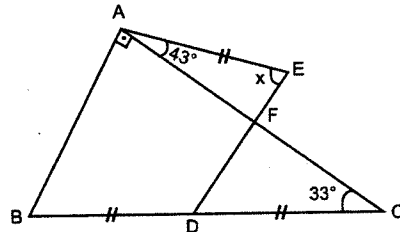
70.

 $|DE| \parallel |AB|$

$x = ?$

Cevap: 25°

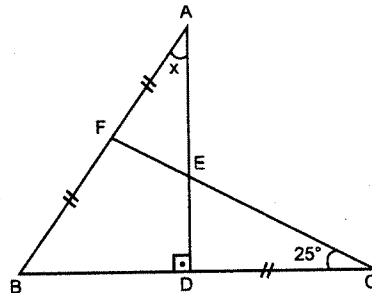
71.



$x = ?$

Cevap: 52°

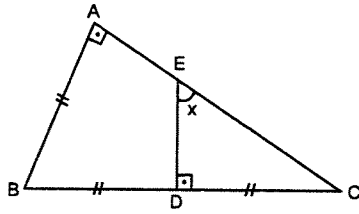
72.



$x = ?$

Cevap: 40°

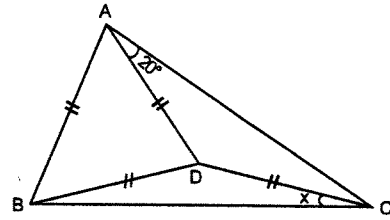
73.



$x = ?$

Cevap: 60°

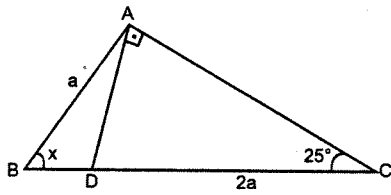
77.



$x = ?$

Cevap: 10°

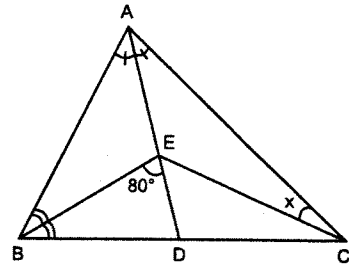
74.



$x = ?$

Cevap: 50°

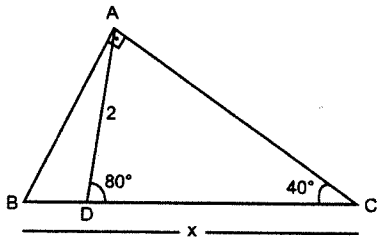
78.



$x = ?$

Cevap: 10°

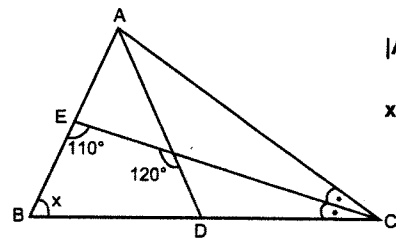
75.



$x = ?$

Cevap: 4

79.

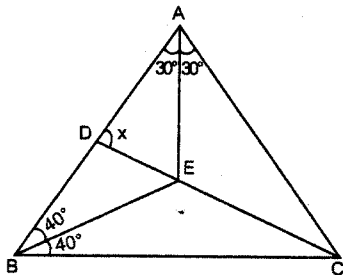


$|AD| = |DC|$

$x = ?$

Cevap: 50°

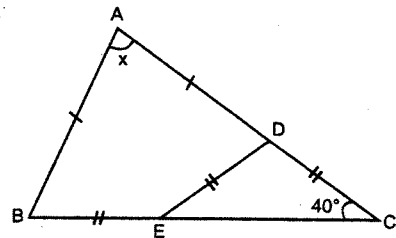
76.



$x = ?$

Cevap: 100°

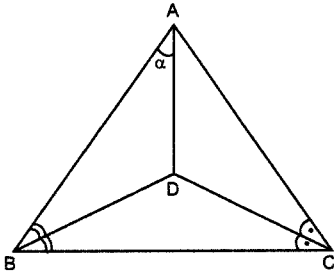
80.



$x = ?$

Cevap: 60°

81.

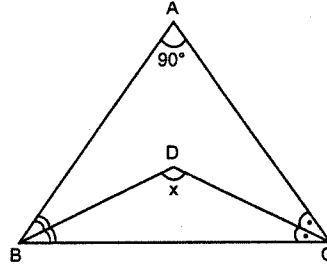


$$m(\widehat{BAC}) = 124$$

$$\alpha = ?$$

Cevap: 62°

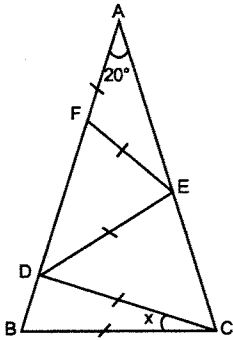
85.



$$x = ?$$

Cevap: 135°

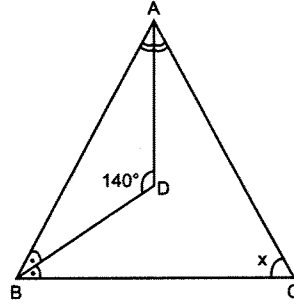
82.



$$x = ?$$

Cevap: 20°

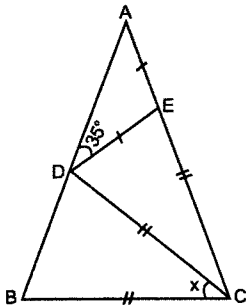
86.



$$x = ?$$

Cevap: 100°

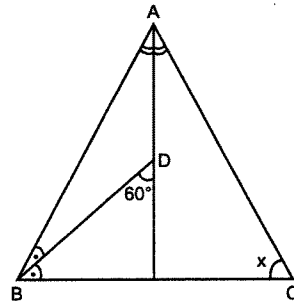
83.



$$x = ?$$

Cevap: 30°

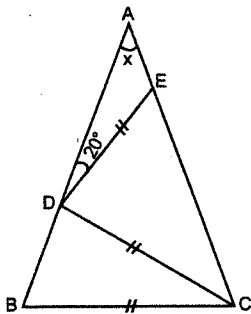
87.



$$x = ?$$

Cevap: 60°

84.

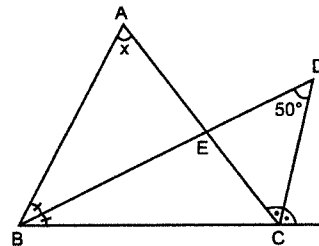


$$|AB| = |AC|$$

$$x = ?$$

Cevap: 28°

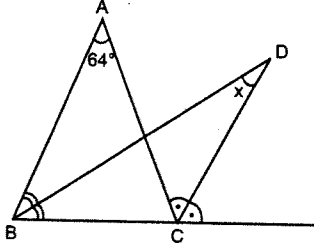
88.



$$x = ?$$

Cevap: 100°

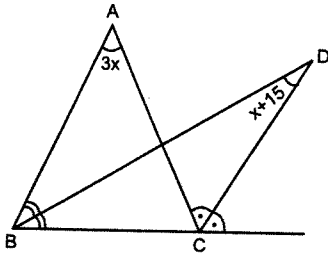
89.



$$x = ?$$

Cevap: 32°

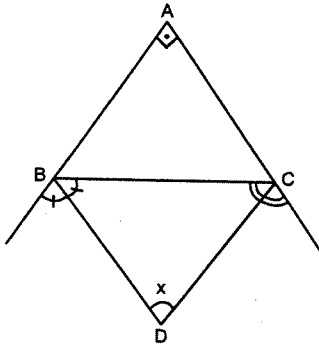
90.



$$x = ?$$

Cevap: 30°

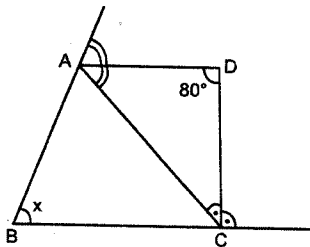
91.



$$x = ?$$

Cevap: 45°

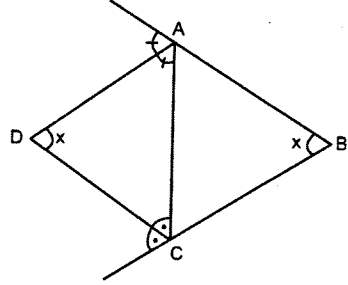
92.



$$x = ?$$

Cevap: 20°

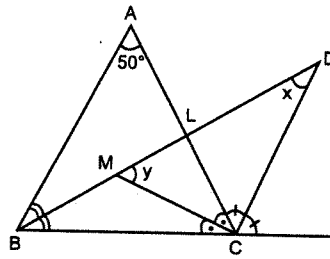
93.



$$x = ?$$

Cevap: 60°

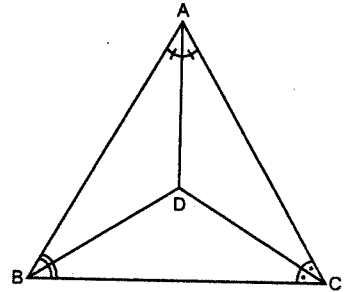
94.



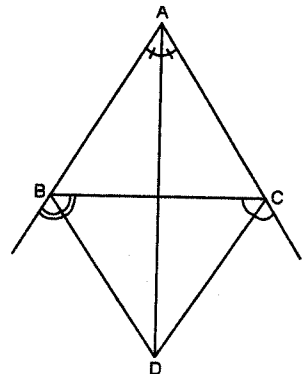
$$y - x = ?$$

Cevap: 40°

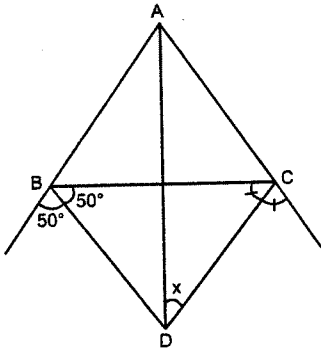
- Üçgenin iç açıortayları bir noktada kesişir. Bu iç açıortaylardan herhangi ikisi verilirse öğrenci üçüncüsünün açıortay olduğunu anlamak zorundadır.



- D: noktası ABC üçgeninin dış açıortaylarının kesim noktasıdır. D noktasına gelen [CD], [AD] ve [BD] açıortaylarının herhangi ikisi soruda verilmişse öğrenci üçüncünün açıortay olduğunu anlamak zorundadır.



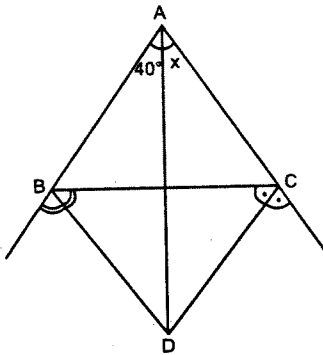
95.



$$x = ?$$

Cevap: 40°

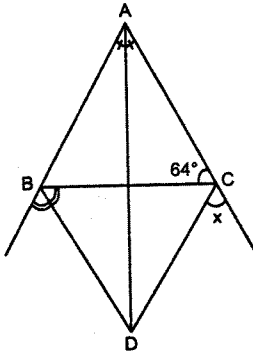
96.



$$x = ?$$

Cevap: 40°

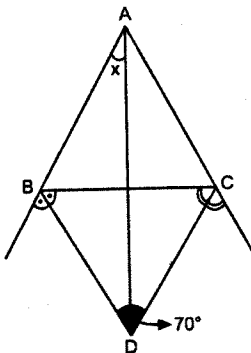
97.



$$x = ?$$

Cevap: 58°

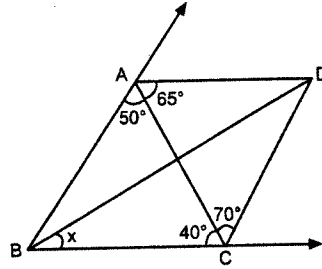
98.



$$x = ?$$

Cevap: 20°

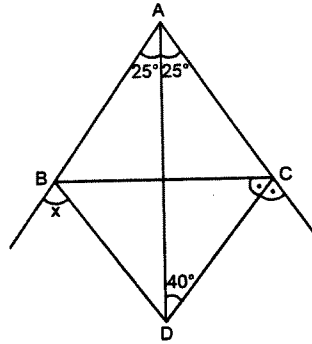
99.



$$x = ?$$

Cevap: 45°

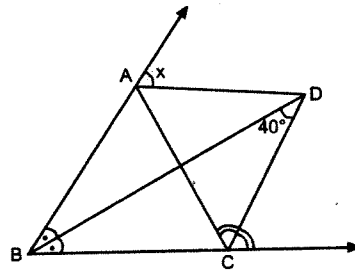
100.



$$x = ?$$

Cevap: 50°

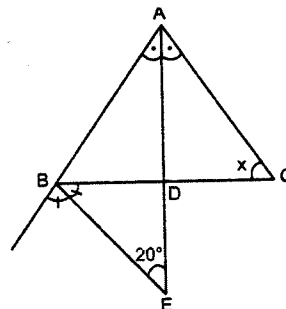
101.



$$x = ?$$

Cevap: 50°

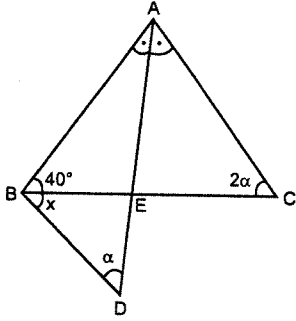
102.



$$x = ?$$

Cevap: 40°

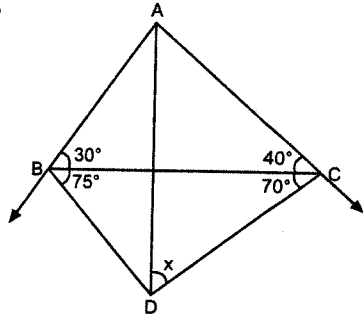
103.



$$x = ?$$

Cevap: 70°

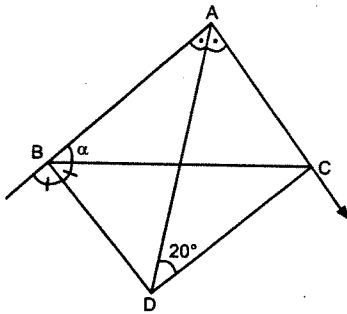
107.



$$x = ?$$

Cevap: 15°

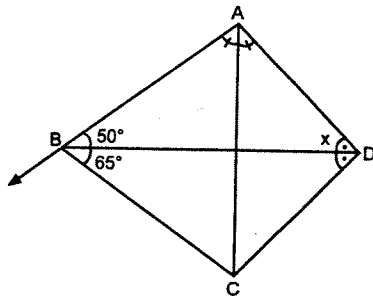
104.



$$\alpha = ?$$

Cevap: 40°

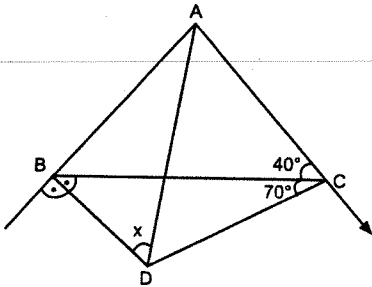
108.



$$x = ?$$

Cevap: 60°

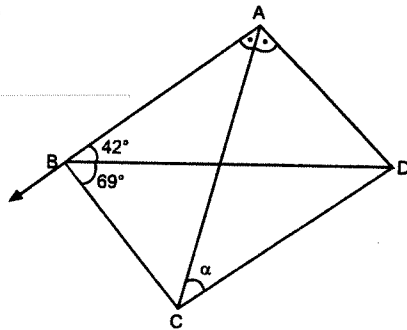
105.



$$x = ?$$

Cevap: 20°

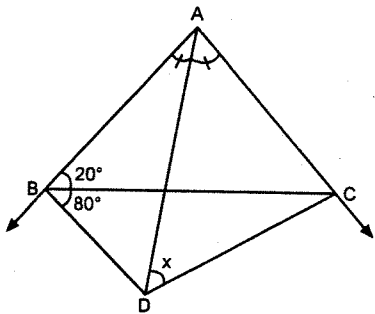
109.



$$\alpha = ?$$

Cevap: 21°

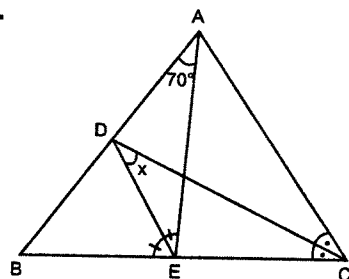
106.



$$x = ?$$

Cevap: 10°

110.

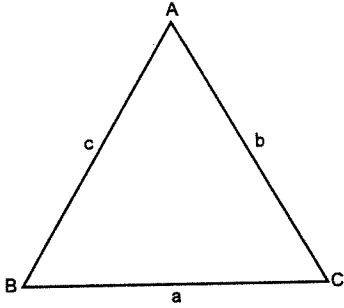


$$x = ?$$

Cevap: 20°

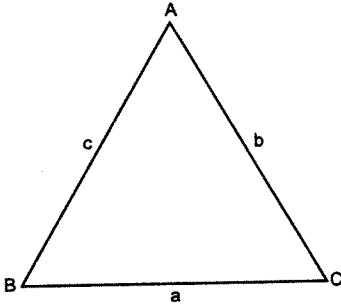
AÇI - KENAR - BAĞINTILARI

1. Herhangi bir kenar, diğer iki kenarın toplamı ile farkı arasındadır.



$$\begin{aligned} b - c &< a < b + c \\ a - c &< b < a + c \\ a - b &< c < a + b \end{aligned}$$

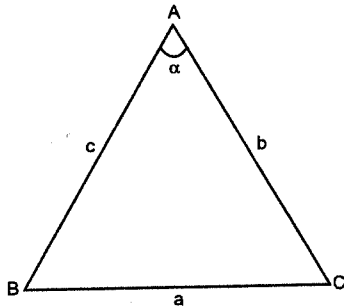
2.



$$a > b > c \Rightarrow m(\widehat{A}) > m(\widehat{B}) > m(\widehat{C})$$

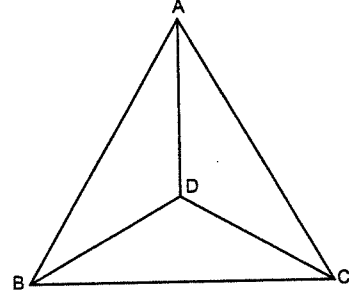
Büyük açının karşısında büyük kenar, küçük açının karşısında küçük kenar bulunur.

3.



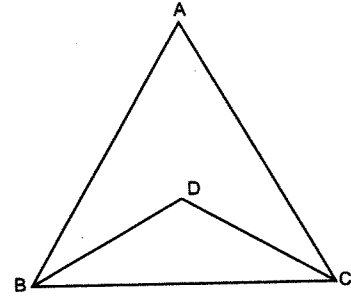
$$\begin{aligned} \alpha = 90^\circ &\Rightarrow a^2 = b^2 + c^2 \\ \alpha > 90^\circ &\Rightarrow a^2 > b^2 + c^2 \\ \alpha < 90^\circ &\Rightarrow a^2 < b^2 + c^2 \text{ dir.} \end{aligned}$$

4.



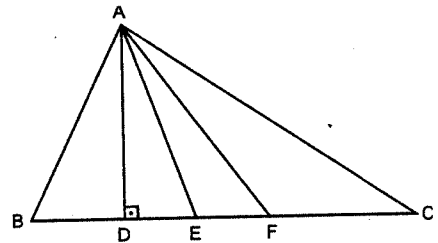
$$\frac{\text{Çevre}(\widehat{ABC})}{2} < |AD| + |DB| + |DC| < \text{Ç}(\widehat{ABC})$$

5.



$$|BC| < |BD| + |DC| < |AB| + |AC|$$

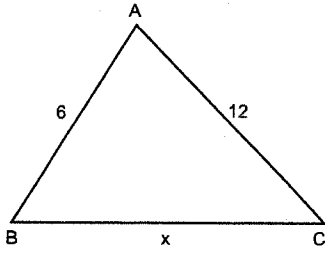
6.



$$\begin{aligned} |AD| &= h_a \rightarrow \text{yükseklik} \\ |AE| &= n_a \rightarrow \text{açıortay} \\ |AF| &= v_a \rightarrow \text{kenarortay ise} \end{aligned}$$

$$h_a < n_a < v_a \text{ ilişkisi vardır.}$$

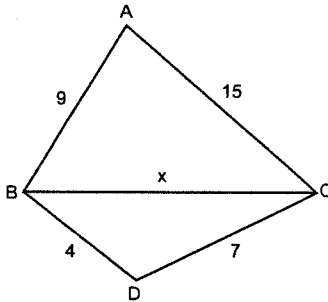
1.



x in alabileceği kaç tane tam-sayı değeri vardır?

Cevap: 11

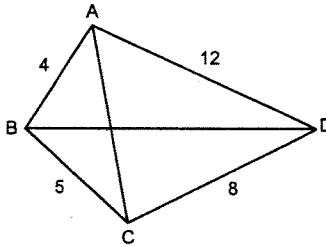
2.



x in alabileceği kaç tane tam-sayı değeri vardır?

Cevap: 4

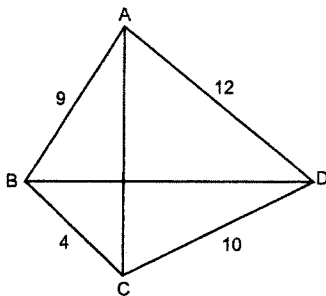
3.



$|AC|, |BD| \in \mathbb{Z}$
 $|AC| + |BD|$ in en büyük değeri kaçtır?

Cevap: 20

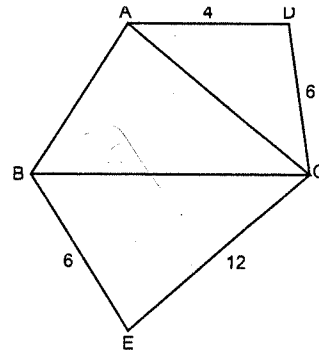
4.



$|AC| + |BD|$ toplamının en büyük tam-sayı değeri kaçtır?

Cevap: 26

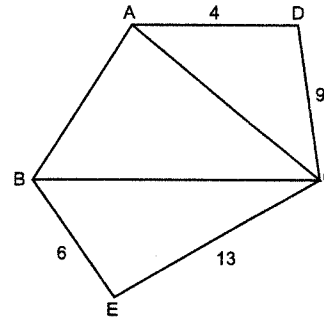
5.



$|AB| \in \mathbb{Z}^+$
 ABC eşkenar üçgenin çevresinin en büyük değeri kaçtır?

Cevap: 27

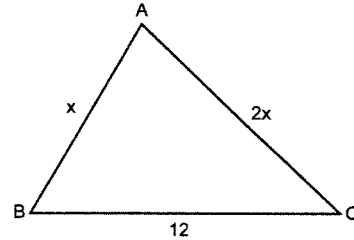
6.



ABC eşkenar üçgenin çevresinin en küçük değeri kaçtır?

Cevap: 22

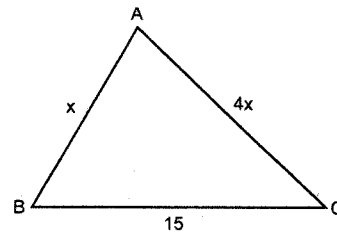
7.



$x \in \mathbb{Z}$
 $\widehat{C(ABC)}$ nin en büyük değeri ile en küçük değerinin toplamı kaçtır?

Cevap: 72

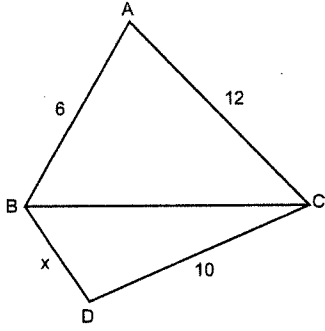
8.



$\widehat{Cevre(ABC)}$ nin en büyük tam-sayı değeri ile en küçük tam-sayı değeri farkı kaçtır?

Cevap: 8

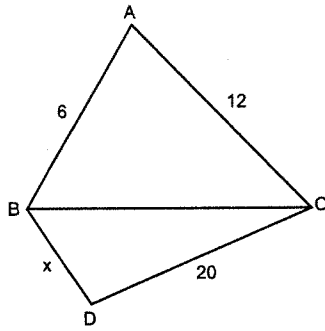
9.



x in en küçük tamsayı değeri kaçtır?

Cevap: 1

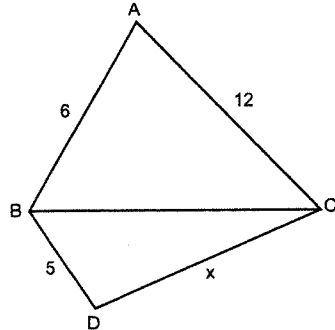
10.



x in en küçük tamsayı değeri kaçtır?

Cevap: 3

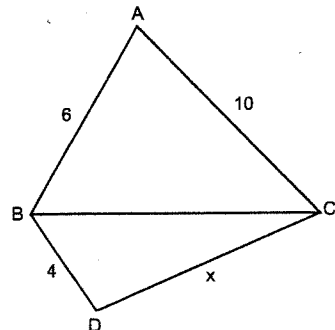
11.



x in en büyük tamsayı değeri kaçtır?

Cevap: 22

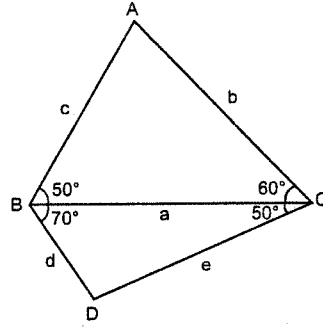
12.



x in en büyük tamsayı değeri kaçtır?

Cevap: 19

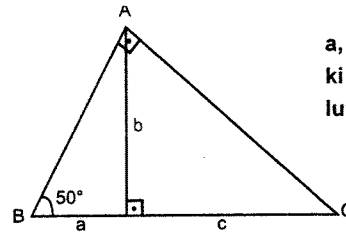
13.



Şekildeki en büyük kenar hangisidir?

Cevap: e

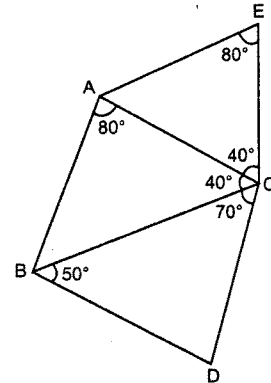
14.



a, b, c arasındaki sıralamayı bulunuz?

Cevap: $c > b > a$

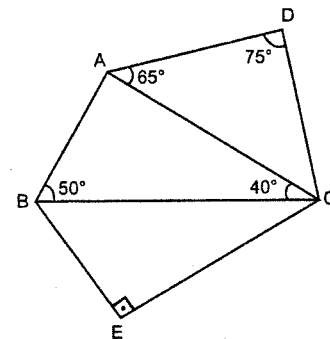
15.



En büyük kenar hangisidir?

Cevap: $|BD|$

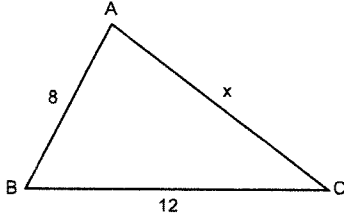
16.



En uzun kenar hangisidir?

Cevap: $|BC|$

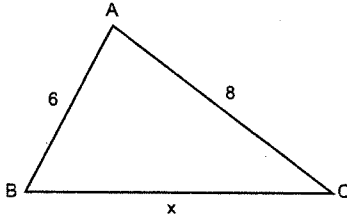
17.



$m(\widehat{A}) > m(\widehat{B}) \Rightarrow x$ in kaç tamsayı değeri vardır?

Cevap: 7

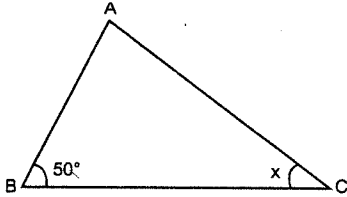
18.



$m(\widehat{A}) > m(\widehat{B}) > m(\widehat{C})$
x in kaç tamsayı değeri vardır?

Cevap: 5

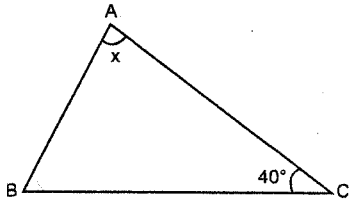
19.



$|BC| > |AC|$ ise
x in en büyük tamsayı değeri kaçtır?

Cevap: 79

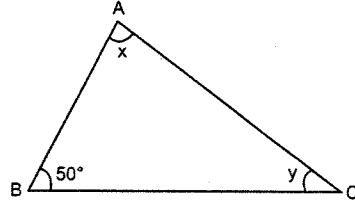
20.



$|BC| > |AC|$ ise
x in en büyük tamsayı değeri kaçtır?

Cevap: 139

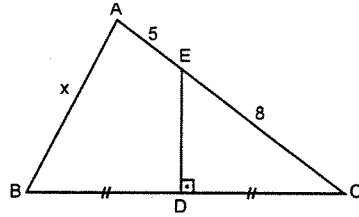
21.



$|BC| > |AC| > |AB|$ ise
x in en büyük değeri ile en küçük değeri toplamı kaçtır?

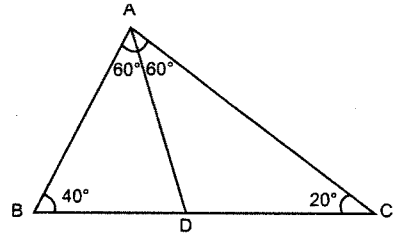
Cevap: 210

22.



x in alabileceği tamsayı değerleri toplamı kaçtır?
Cevap: 72

23.

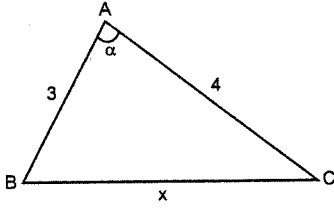


Aşağıdakilerden kaç tanesi doğrudur?

 $|AC| > |AB|$ $|DC| > |AD|$ $|BD| > |AD|$ $|AB| > |BD|$ $|BC| > |AD|$ $|AC| > |AB|$ $|DC| > |BD|$

Cevap: 7

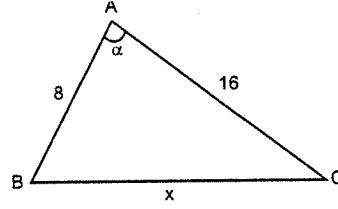
24.



$\alpha > 90^\circ$
 $x \in \mathbb{Z}^+$
 x in değeri kaçtır?

Cevap: 6

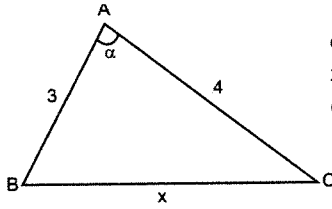
28.



$\alpha = 90^\circ$
 $x = ?$

Cevap: $8\sqrt{5}$

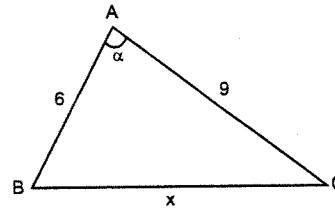
25.



$\alpha < 90^\circ$
 x in kaç tamsayı değeri vardır?

Cevap: 3

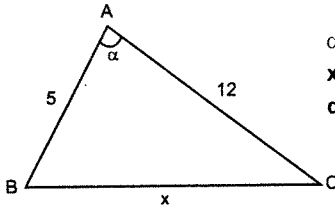
29.



$\alpha < 90^\circ$
 x in en büyük tamsayı değeri kaçtır?

Cevap: 10

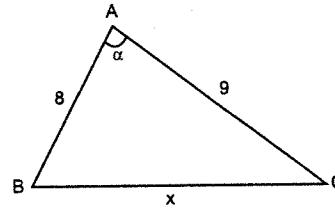
26.



$\alpha > 90^\circ$
 x in kaç tamsayı değeri vardır?

Cevap: 3

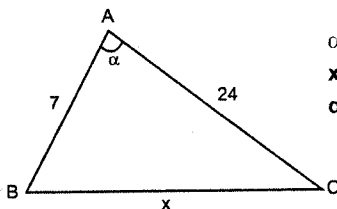
30.



$\alpha > 90^\circ$
 x in en küçük tamsayı değeri kaçtır?

Cevap: 13

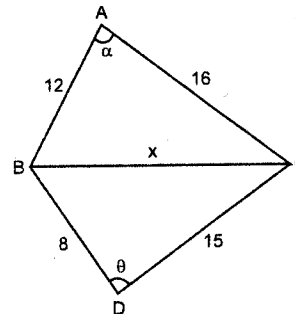
27.



$\alpha < 90^\circ$
 x in kaç tamsayı değeri vardır?

Cevap: 7

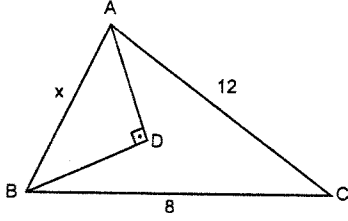
31.



$\alpha < 90^\circ$
 $\theta > 90^\circ$
 x in alabileceği tam sayı değerleri toplamı kaçtır?

Cevap: 37

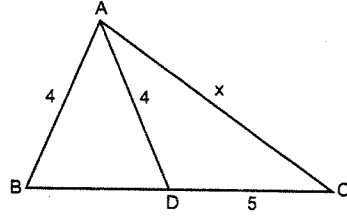
32.



x in en büyük tamsayı değeri kaçtır?

Cevap: 14

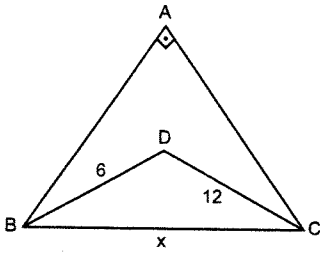
36.



x in en küçük tamsayı değeri kaçtır?

Cevap: 7

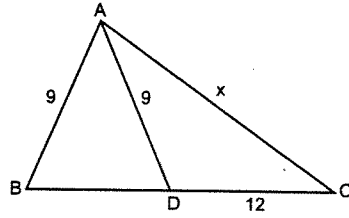
33.



x in en küçük tamsayı değeri kaçtır?

Cevap: 14

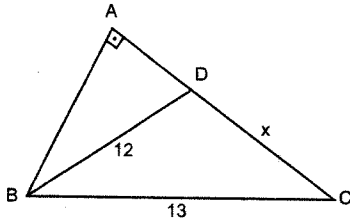
37.



x in kaç tamsayı değeri vardır?

Cevap: 5

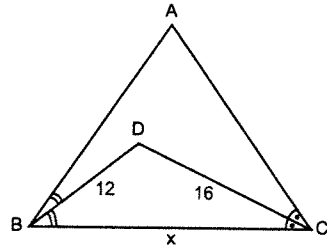
34.



x in alabileceği tamsayı değerleri kaç tanedir?

Cevap: 3

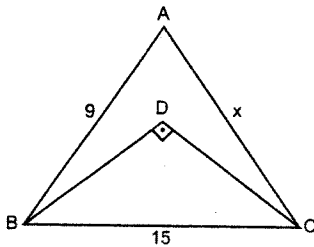
38.



x in kaç tamsayı değeri vardır?

Cevap: 7

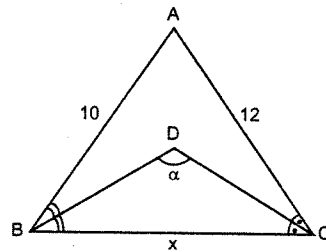
35.



x in alabileceği kaç tamsayı değeri vardır?

Cevap: 11

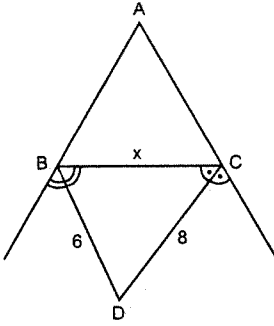
39.



$\alpha > 135$
 x in en küçük tamsayı değeri kaçtır?

Cevap: 16

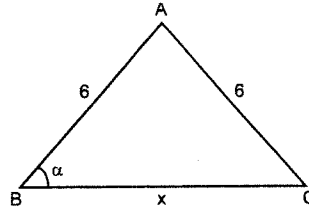
40.



x in alabileceği
tamsayı değerleri
kaç tanedir?

Cevap: 4

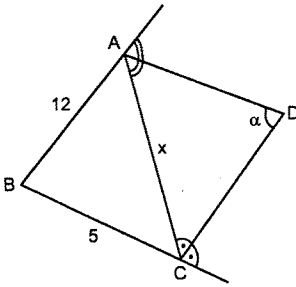
44.

 $\alpha < 45^\circ$

x in alabileceği
en küçük tamsa-
yı değeri kaçtır?

Cevap: 9

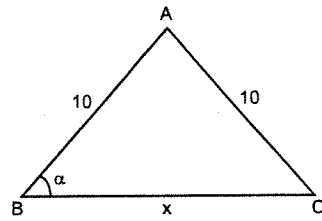
41.

 $\alpha < 45^\circ$

x in en küçük
tam sayı değeri
kaçtır?

Cevap: 14

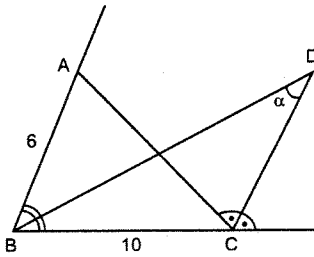
45.

 $\alpha > 45^\circ$

x in alabileceği
en büyük tamsa-
yı değeri kaçtır?

Cevap: 14

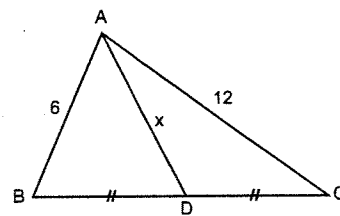
42.

 $\alpha > 45^\circ$

$|AC|$ nin alabi-
leceği tamsayı
değerleri kaç
tanedir?

Cevap: 3

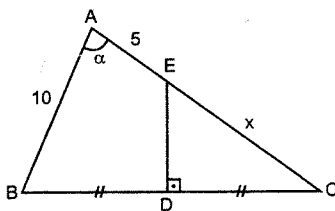
46.



x in kaç tam-
sayı değeri
vardır?

Cevap: 5

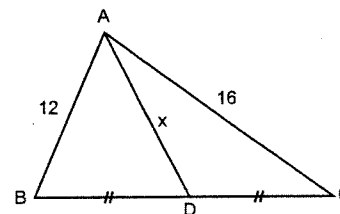
43.

 $\alpha > 90^\circ$

x in en küçük
tam sayı değeri
kaçtır?

Cevap: 12

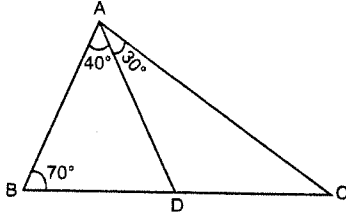
47.

 $m(\widehat{A}) > 90^\circ$

x in kaç tam-
sayı değeri
vardır?

Cevap: 7

48.

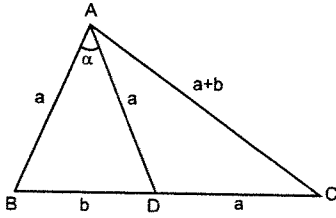


Aşağıdakilerden kaç tanesi yanlıştır?

1. $|AB| = |AD|$
2. $|BC| > |AD|$
3. $|AC| > |AD|$
4. $|AC| = |BC|$
5. $|DC| > |AB|$
6. $|BD| < |AD|$

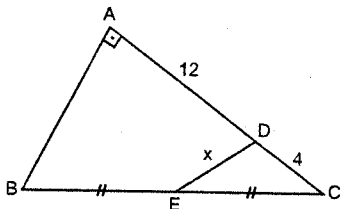
Cevap: 1

49.

 $\alpha = ?$

Cevap: 36

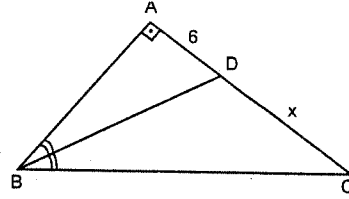
50.



x in en küçük tam sayı değeri kaçtır?

Cevap: 5

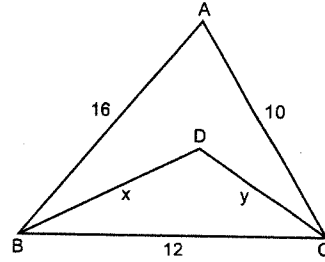
51.



x in en küçük tam sayı değeri kaçtır?

Cevap: 7

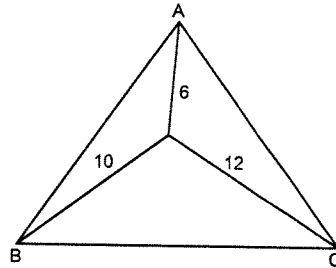
52.



x+y nin en küçük ve en büyük tam sayı değerleri toplamı kaçtır?

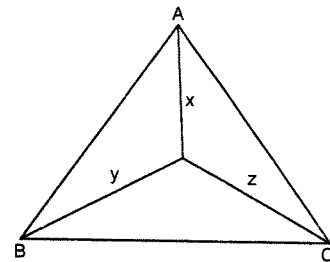
Cevap: 38

53.

Çevre $\widehat{ABC}$ nin en büyük tamsayı değeri kaçtır?

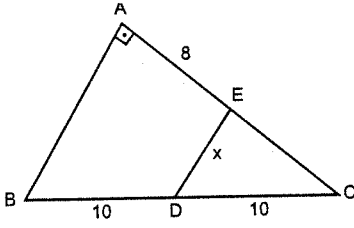
Cevap: 55

54.

 $\widehat{ABC} = 30$ cm ise x+y+z nin en büyük ve en küçük tamsayı değerleri toplamı kaçtır?

Cevap: 45

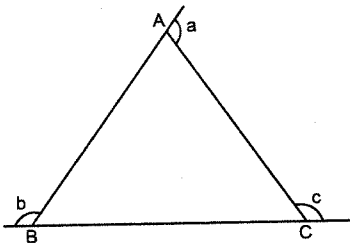
55.



x in alabileceği en büyük tamsayı değeri kaçtır?

Cevap: 9

56.

 $a + c > 2b$ ise b nin en büyük tamsayı değeri kaçtır?

Cevap: 119

57.

 $a > b > c$ ise

yardımcı elemanları arasındaki sıralama yukarıdaki eşitsizliğin tam tersidir.

Bu bilgiye göre, aşağıdakilerden kaç tanesi doğrudur?

I. $h_a < h_b < h_c$

Yükseklik

II. $v_a < v_b < v_c$

Kenarortay

III. $n_a < n_b < n_c$

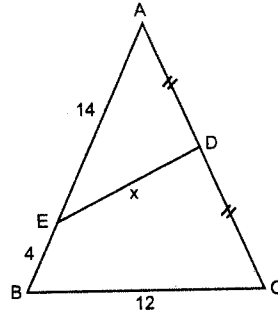
Açıortay

IV. $\frac{1}{h_a} > \frac{1}{h_b} > \frac{1}{h_c}$

V. $h_a < n_a < v_a$

Cevap: 5

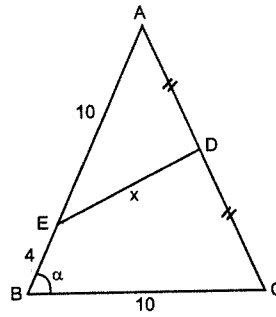
58.



x in kaç tamsayı değeri vardır?

Cevap: 9

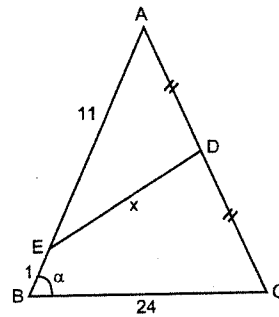
59.

 $\alpha < 90^\circ$

x in en küçük tamsayı değeri kaçtır?

Cevap: 6

60.

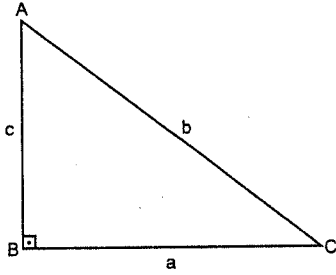
 $\alpha < 90^\circ$

x in en küçük tamsayı değeri kaçtır?

Cevap: 14

ÖZEL ÜÇGENLER

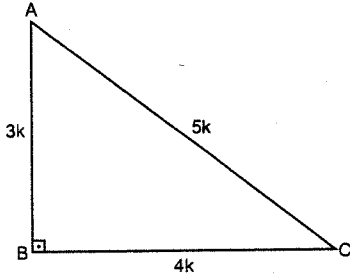
*



Pisagor Bağintısı

$$b^2 = a^2 + c^2$$

*



$k = 1 \Rightarrow 3 - 4 - 5$ üçgeni

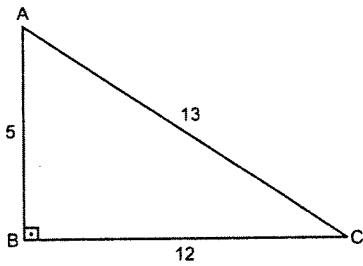
$k = 2 \Rightarrow 6 - 8 - 10$ üçgeni

$k = 3 \Rightarrow 9 - 12 - 15$ üçgeni

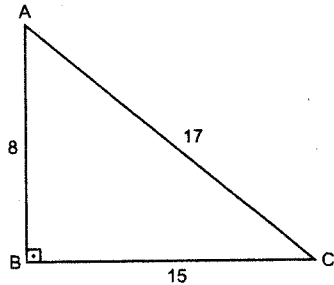
$k = 4 \Rightarrow 12 - 16 - 20$ üçgeni

$k = 5 \Rightarrow 15 - 20 - 25$ üçgeni

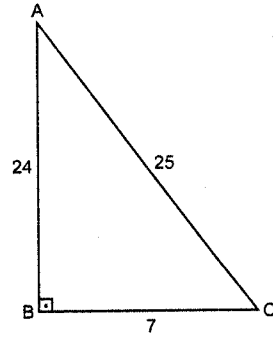
*



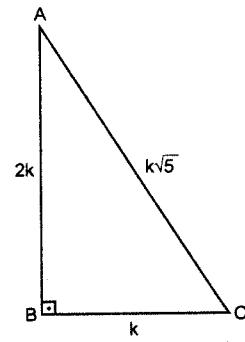
*



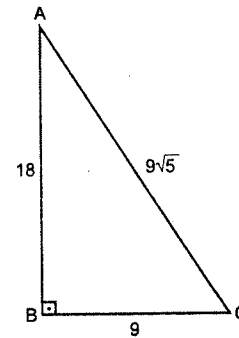
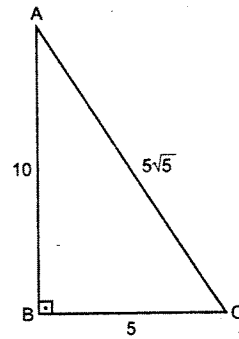
*



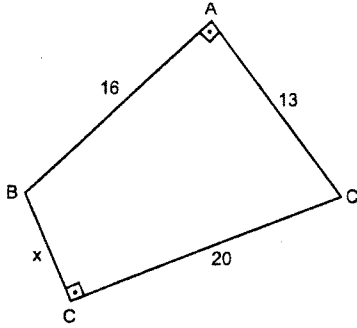
*



Örnek:



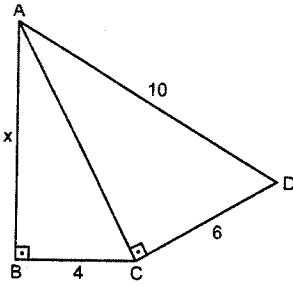
1.



$x = ?$

Cevap: 5

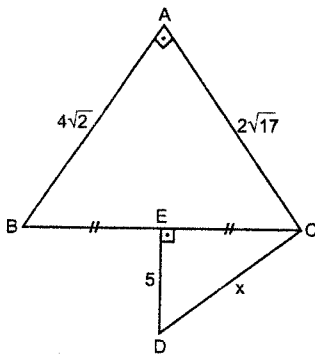
2.



$x = ?$

Cevap: $4\sqrt{3}$

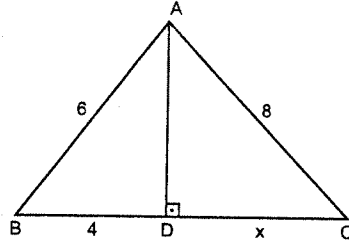
3.



$x = ?$

Cevap: $5\sqrt{2}$

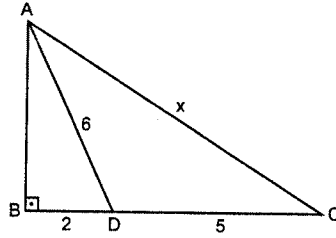
4.



$x = ?$

Cevap: $2\sqrt{11}$

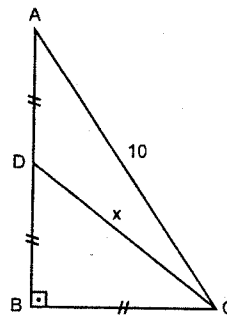
5.



$x = ?$

Cevap: 9

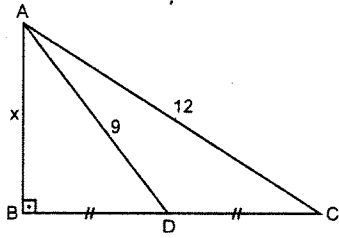
6.



$x = ?$

Cevap: $2\sqrt{10}$

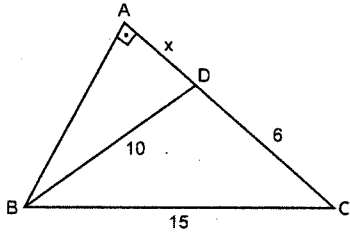
7.



$x = ?$

Cevap: $2\sqrt{15}$

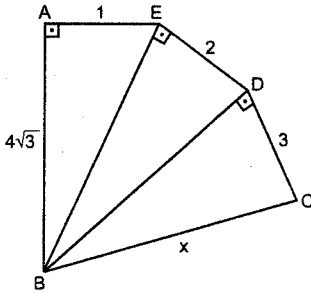
8.



$x = ?$

Cevap: $\frac{89}{12}$

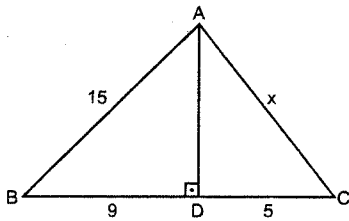
9.



$x = ?$

Cevap: $\sqrt{62}$

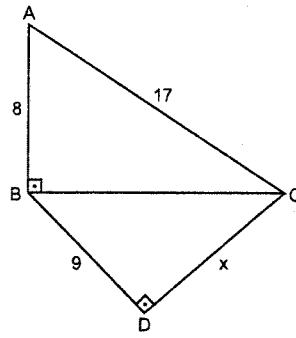
10.



$x = ?$

Cevap: 13

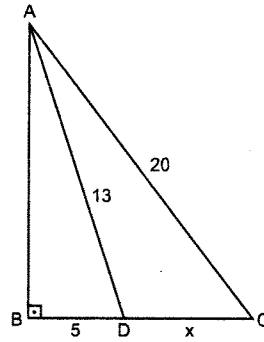
11.



$x = ?$

Cevap: 12

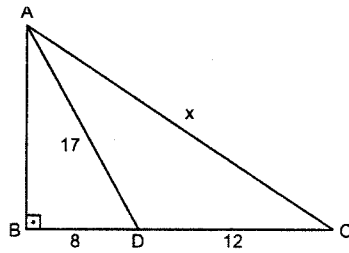
12.



$x = ?$

Cevap: 11

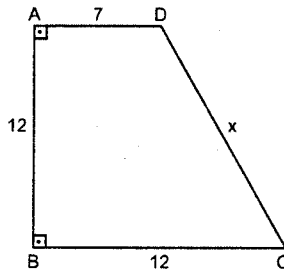
13.



$x = ?$

Cevap: 25

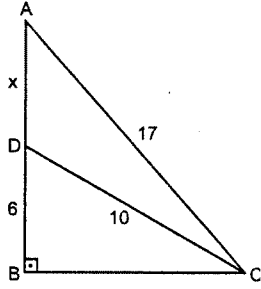
14.



$x = ?$

Cevap: 13

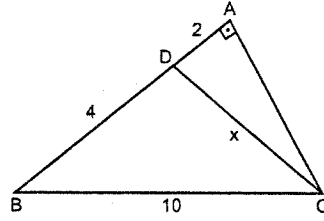
15.



$x = ?$

Cevap: 9

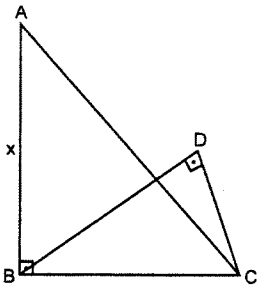
19.



$x = ?$

Cevap: $2\sqrt{17}$

16.

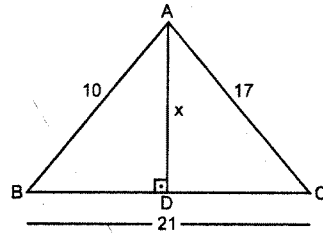


$|BD| = 12$
 $|DC| = 9$
 $|AC| = 17$

$x = ?$

Cevap: 8

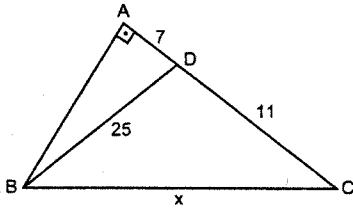
20.



$x = ?$

Cevap: 8

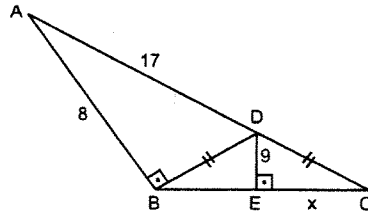
17.



$x = ?$

Cevap: 30

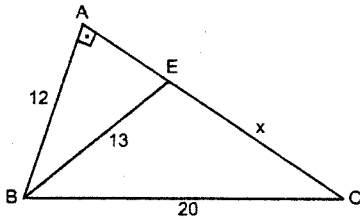
21.



$x = ?$

Cevap: 12

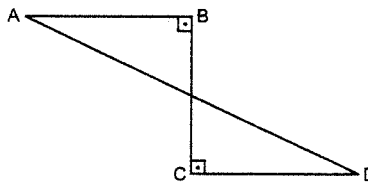
18.



$x = ?$

Cevap: 11

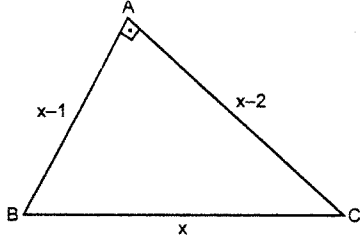
22.



$|AB| = 7$
 $|BC| = 5$
 $|CD| = 5$
 $|AD| = ?$

Cevap: 13

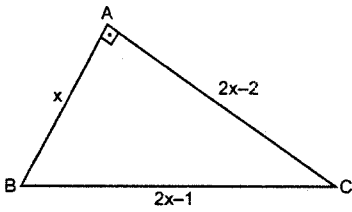
23.



$x = ?$

Cevap: 5

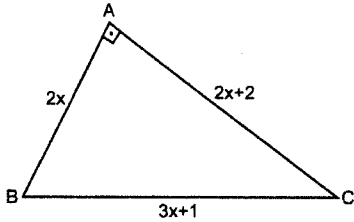
24.



$x = ?$

Cevap: 3

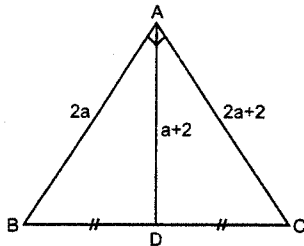
25.



$x = ?$

Cevap: 3

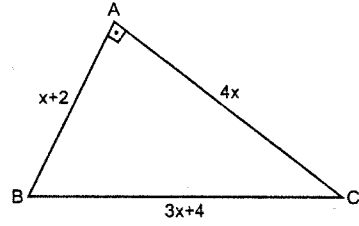
26.



$a = ?$

Cevap: 3

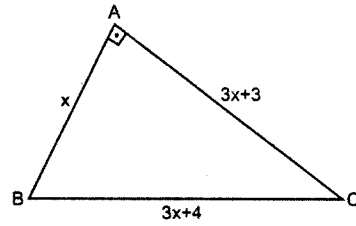
27.



$x = ?$

Cevap: 3

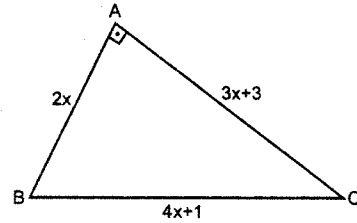
28.



$x = ?$

Cevap: 7

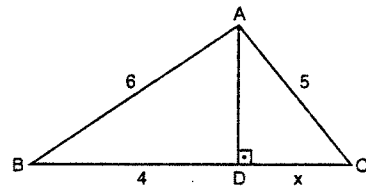
29.



$x = ?$

Cevap: 4

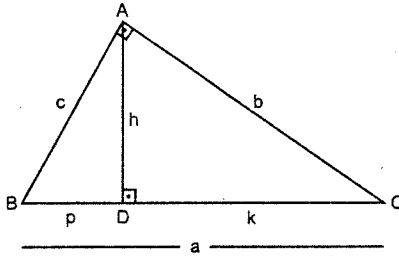
30.



$x = ?$

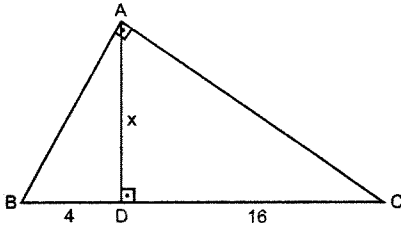
Cevap: $\sqrt{5}$

ÖKLİD BAĞINTILARI



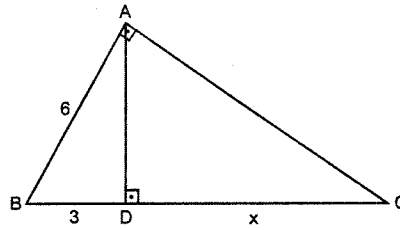
1. $h^2 = p.k$
2. $c^2 = p.a$
3. $b^2 = k.a$
4. $a.h = b.c$

31.

 $x = ?$

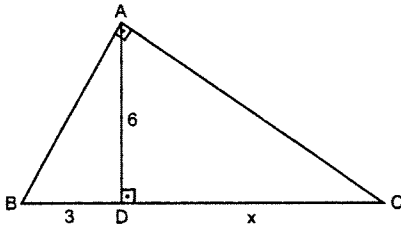
Cevap: 8

34.

 $x = ?$

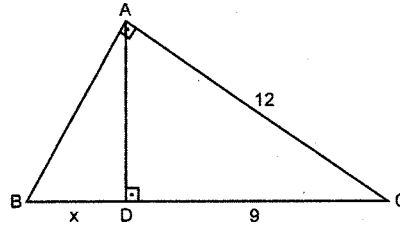
Cevap: 9

32.

 $x = ?$

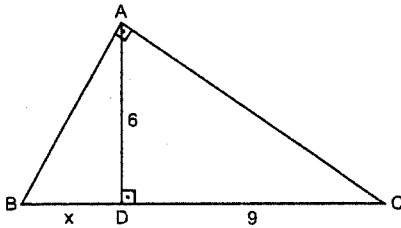
Cevap: 12

35.

 $x = ?$

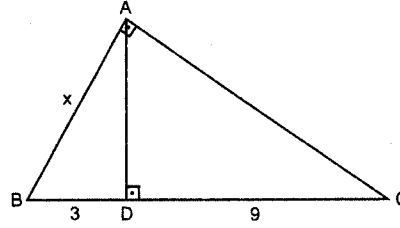
Cevap: 7

33.

 $x = ?$

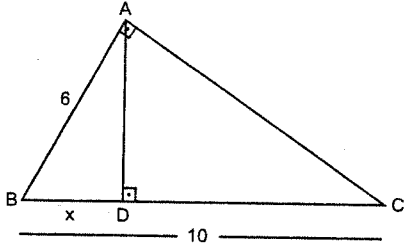
Cevap: 4

36.

 $x = ?$

Cevap: 6

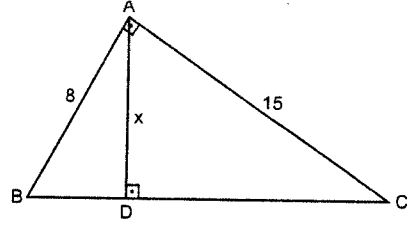
37.



$x = ?$

Cevap: 3,6

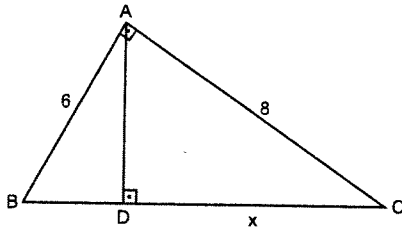
41.



$x = ?$

Cevap: $\frac{120}{17}$

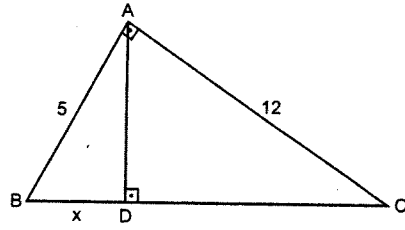
38.



$x = ?$

Cevap: 6,4

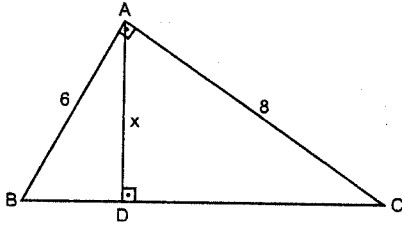
42.



$x = ?$

Cevap: $\frac{25}{13}$

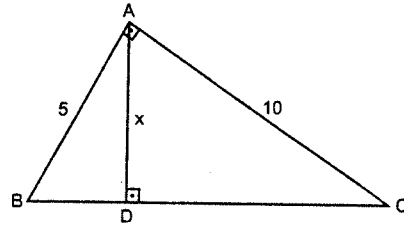
39.



$x = ?$

Cevap: 4,8

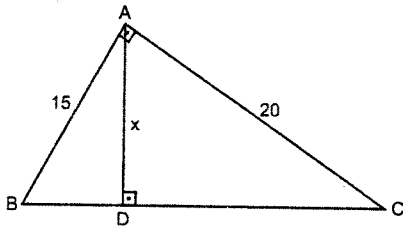
43.



$x = ?$

Cevap: $2\sqrt{5}$

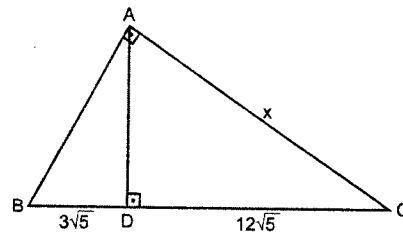
40.



$x = ?$

Cevap: 12

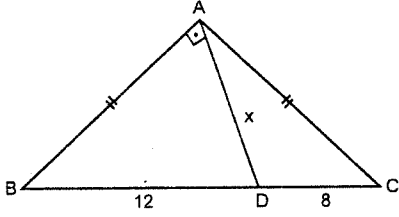
44.



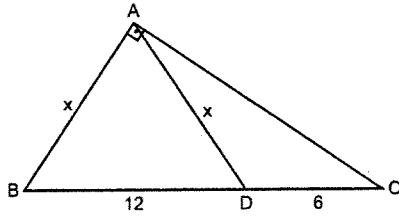
$x = ?$

Cevap: 30

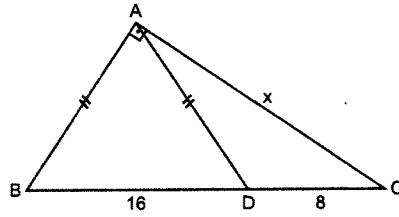
45.

 $x = ?$ Cevap: $2\sqrt{6}$

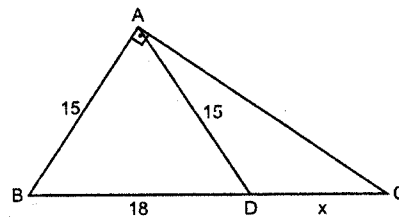
46.

 $x = ?$ Cevap: $6\sqrt{3}$

47.

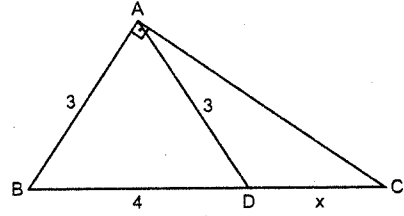
 $x = ?$ Cevap: $8\sqrt{6}$

48.

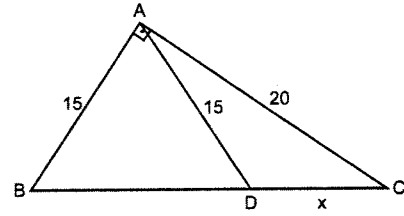
 $x = ?$

Cevap: 7

49.

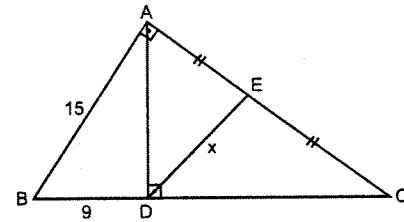
 $x = ?$ Cevap: $\frac{1}{2}$

50.

 $x = ?$

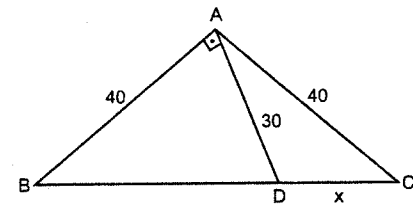
Cevap: 7

51.

 $x = ?$

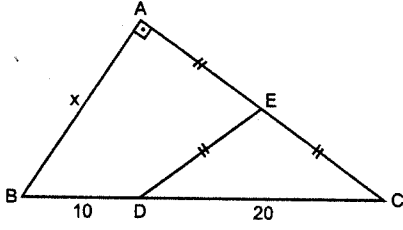
Cevap: 10

52.

 $x = ?$

Cevap: 14

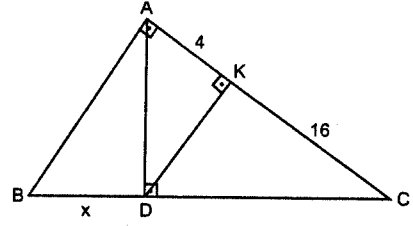
53.



$x = ?$

Cevap: $10\sqrt{3}$

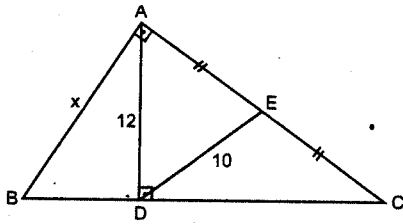
57.



$x = ?$

Cevap: $2\sqrt{5}$

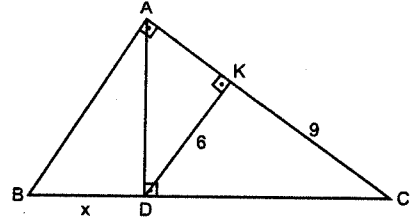
54.



$x = ?$

Cevap: 15

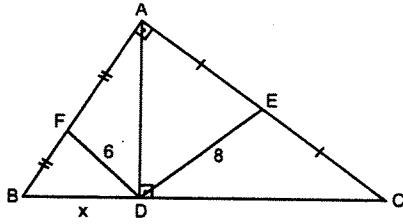
58.



$x = ?$

Cevap: $\frac{4\sqrt{13}}{3}$

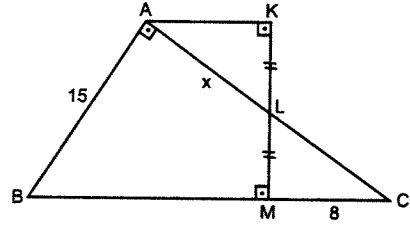
55.



$x = ?$

Cevap: 7,2

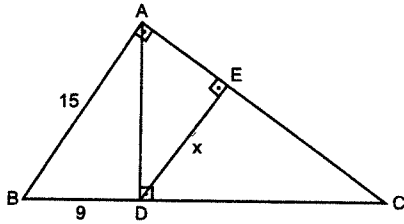
59.



$x = ?$

Cevap: 10

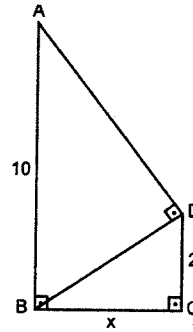
56.



$x = ?$

Cevap: 9,6

60.

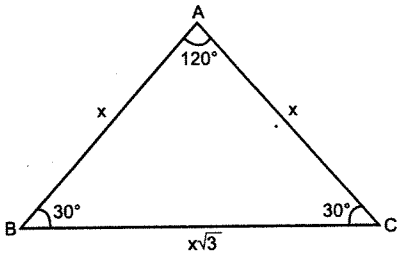
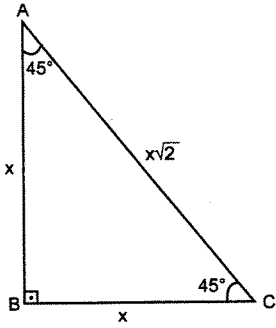
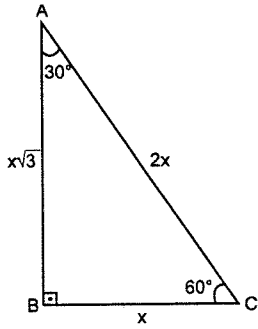


$x = ?$

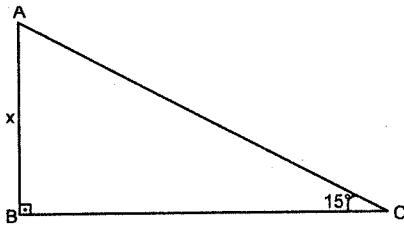
Cevap: 4

Açılarına Göre Özel Üçgenler

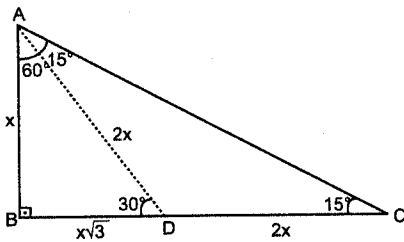
*



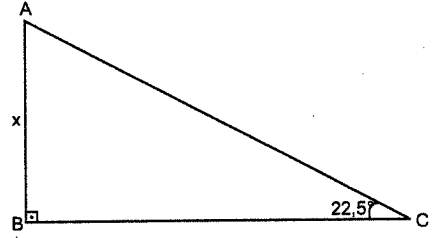
*



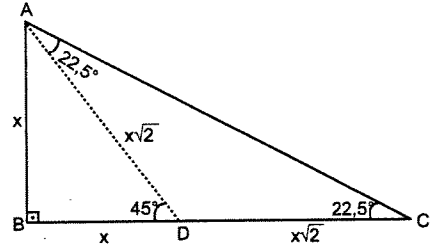
15° lik açı alınırsa



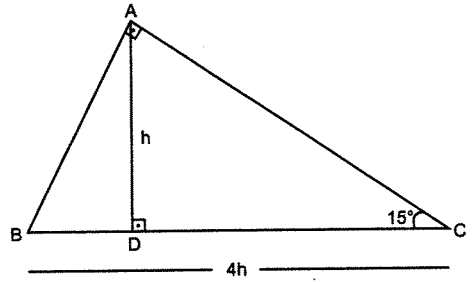
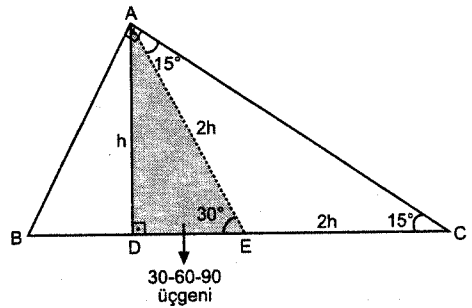
*



22.5° lik açı alınırsa

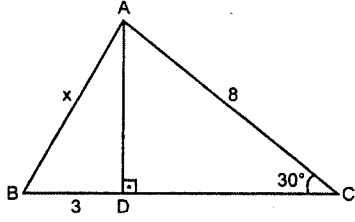


*

15 – 75 – 90 üçgeninde yükseklik,
hipotenüsün 4'te birine eşittir.

$|AE| = |EC| = |BE| = 2h$
 $|BC| = 4h$ olur.

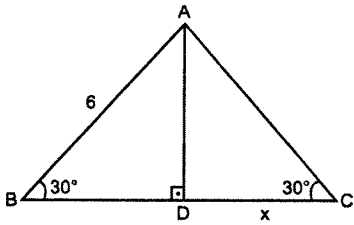
61.



$x = ?$

Cevap: 5

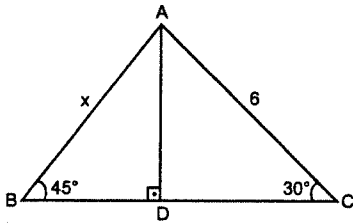
62.



$x = ?$

Cevap: $3\sqrt{3}$

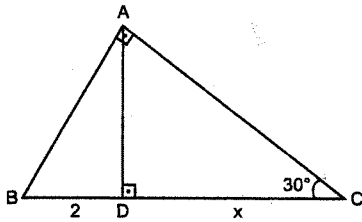
63.



$x = ?$

Cevap: $3\sqrt{2}$

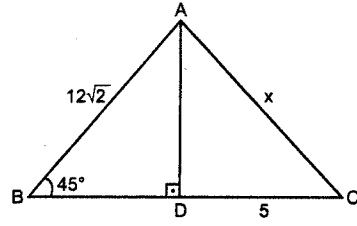
64.



$x = ?$

Cevap: 6

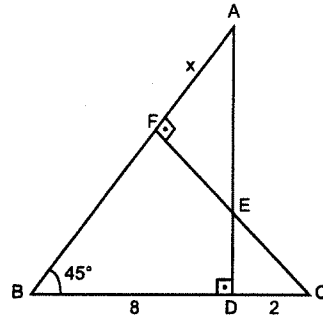
65.



$x = ?$

Cevap: 13

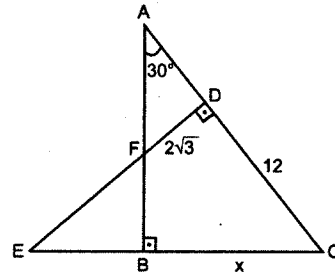
66.



$x = ?$

Cevap: $3\sqrt{2}$

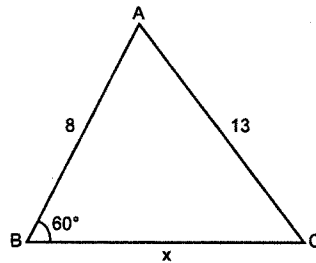
67.



$x = ?$

Cevap: 9

68.

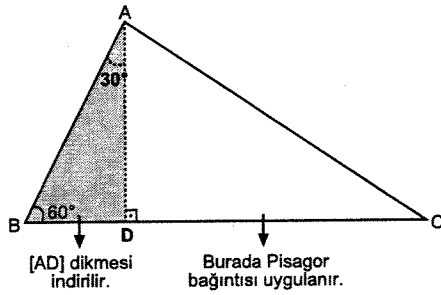
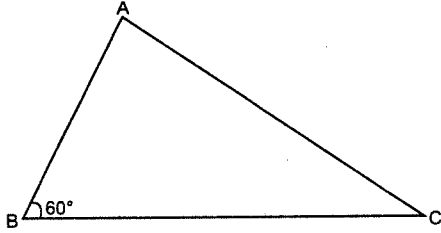


$x = ?$

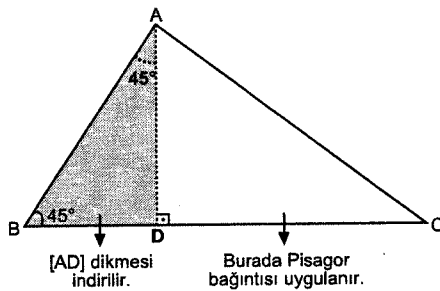
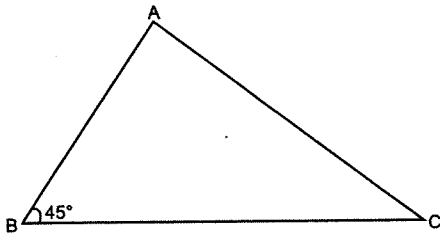
Cevap: 15

Bir üçgenin açılarından herhangi biri (30° , 45° , 60°) ise bu açının karşısına bir dik indirilerek ($30-60-90$) veya ($45-45-90$) üçgenleri elde edilir.

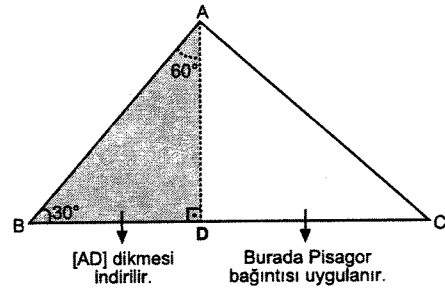
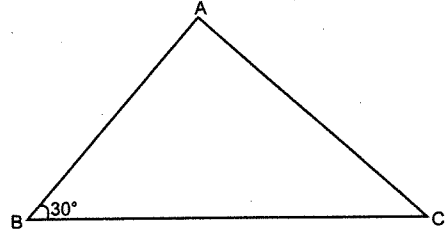
* Sorunun orijinali böyle ise;



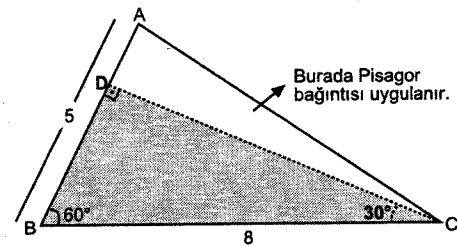
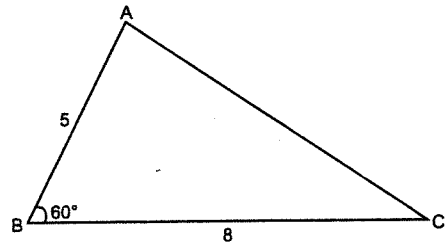
* Sorunun orijinali böyle ise;



* Sorunun orijinali böyle ise;

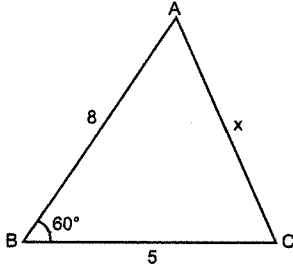


* Yalnız dik indirirken hipotenüsün çift sayı olmasına dikkat ediniz.



(Dik'i böyle indirin)

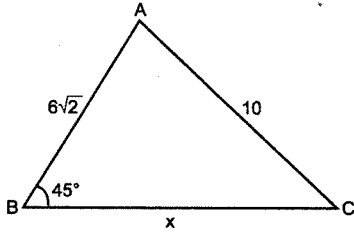
69.



$x = ?$

Cevap: 7

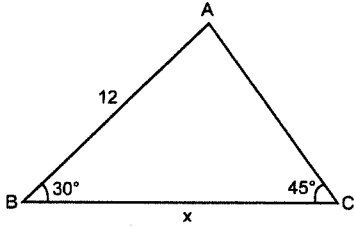
70.



$x = ?$

Cevap: 14

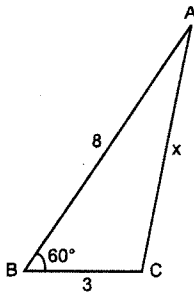
71.



$x = ?$

Cevap: $6 + 6\sqrt{3}$

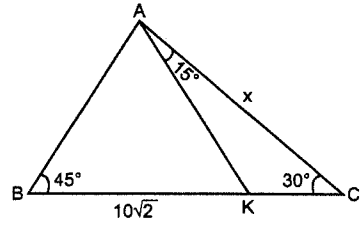
72.



$x = ?$

Cevap: 7

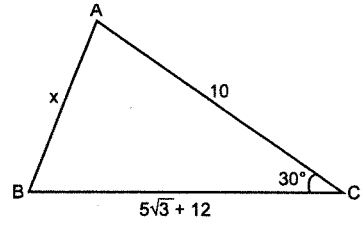
73.



$x = ?$

Cevap: $10\sqrt{2}$

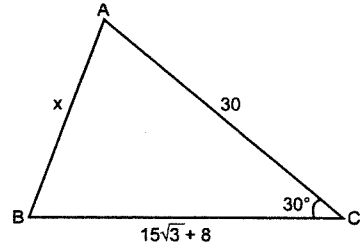
74.



$x = ?$

Cevap: 13

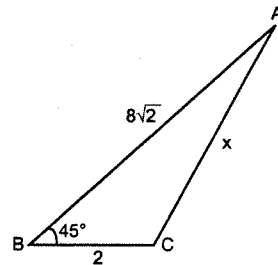
75.



$x = ?$

Cevap: 17

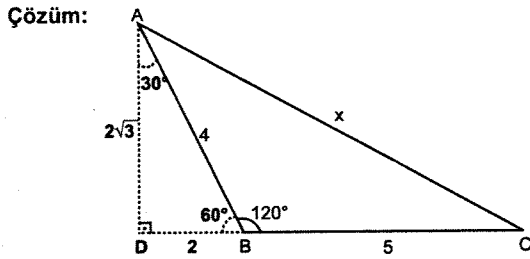
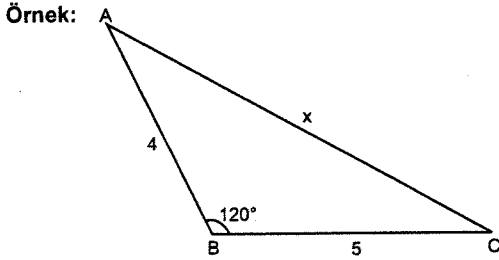
76.



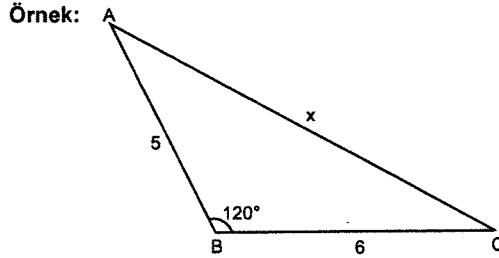
$x = ?$

Cevap: 10

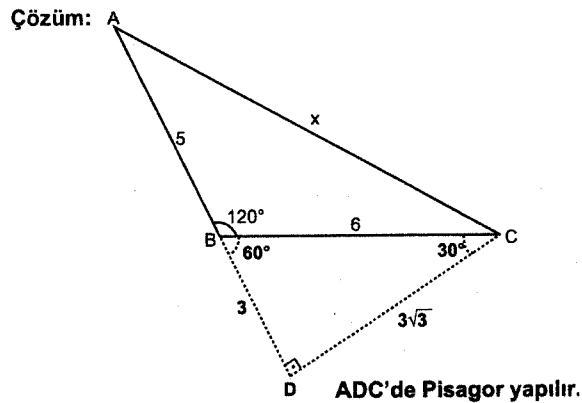
Bir üçgenin açılarından herhangi biri ($120^\circ, 135^\circ, 150^\circ$) ise bu açıların dışına doğru bir dik indirilerek ($30-60-90$), veya ($45-45-90$) üçgeni elde ederiz. Sonra büyük üçgende PISAGOR bağıntısı ile soruyu çözeriz.



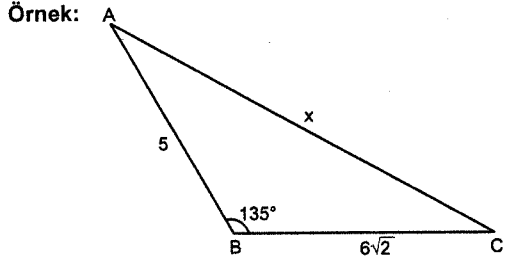
ADC'de Pisagor yapılır.



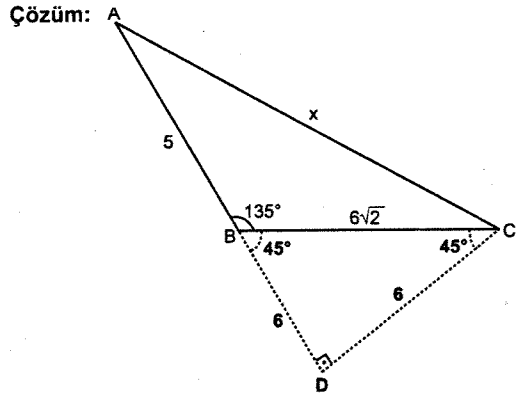
(Dikkat! Çift sayıya doğru dik indiriniz)



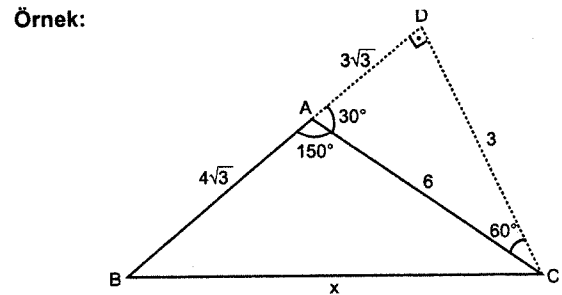
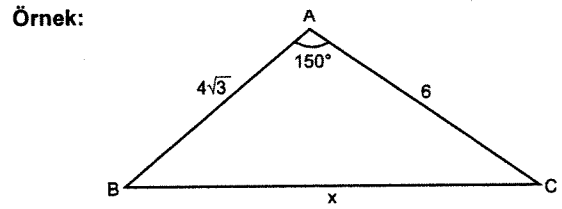
ADC'de Pisagor yapılır.



($\sqrt{2}$ 'li sayıya doğru dik indiriniz)

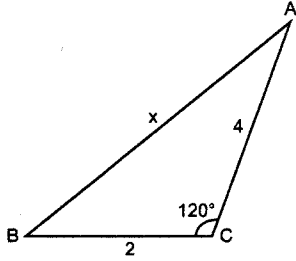


ADC'de Pisagor yapılır.



BDC de Pisagor yapılır.

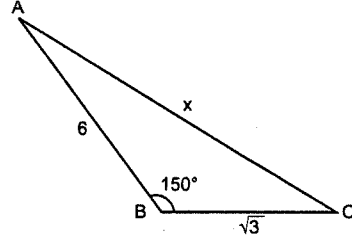
77.



$$x = ?$$

Cevap: $2\sqrt{7}$

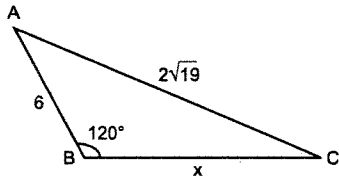
81.



$$x = ?$$

Cevap: $\sqrt{57}$

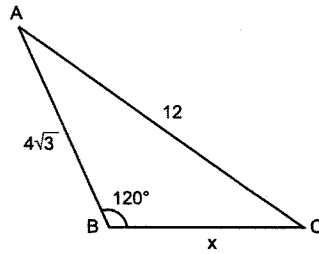
78.



$$x = ?$$

Cevap: 4

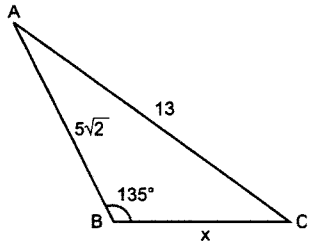
82.



$$x = ?$$

Cevap: $4\sqrt{3}$

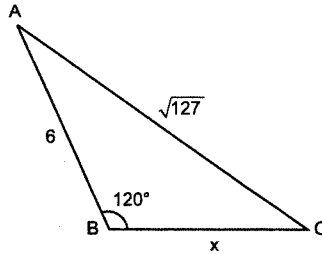
79.



$$x = ?$$

Cevap: 7

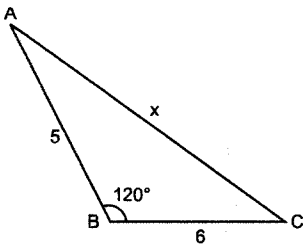
83.



$$x = ?$$

Cevap: 7

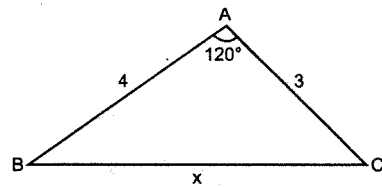
80.



$$x = ?$$

Cevap: $\sqrt{91}$

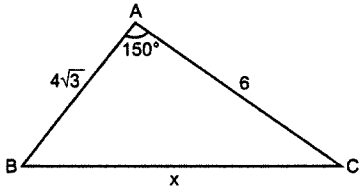
84.



$$x = ?$$

Cevap: $\sqrt{37}$

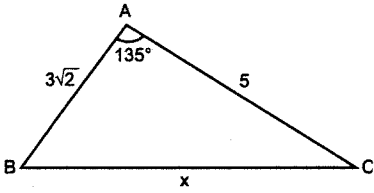
85.



$x = ?$

Cevap: $2\sqrt{39}$

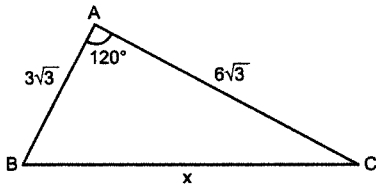
86.



$x = ?$

Cevap: $\sqrt{73}$

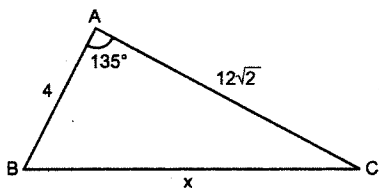
87.



$x = ?$

Cevap: $3\sqrt{21}$

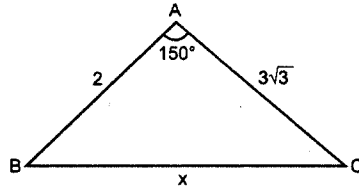
88.



$x = ?$

Cevap: 20

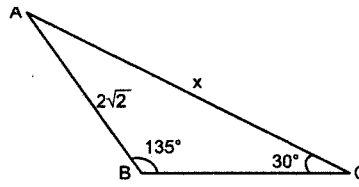
89.



$x = ?$

Cevap: 7

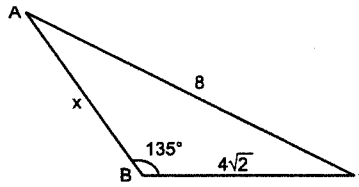
90.



$x = ?$

Cevap: 4

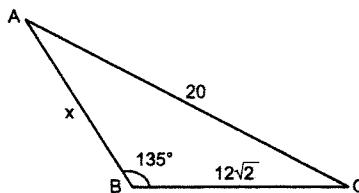
91.



$x = ?$

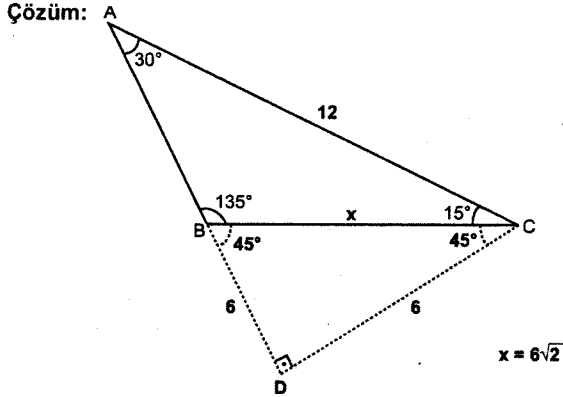
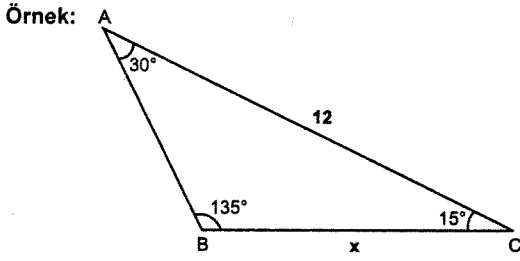
Cevap: $4\sqrt{3} - 4$

92.



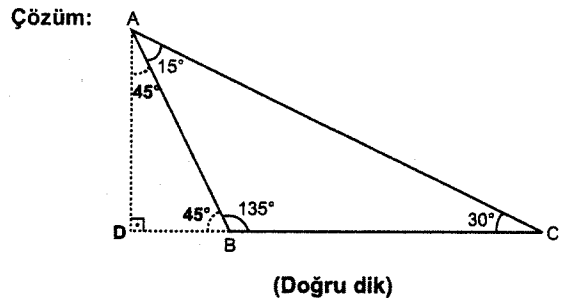
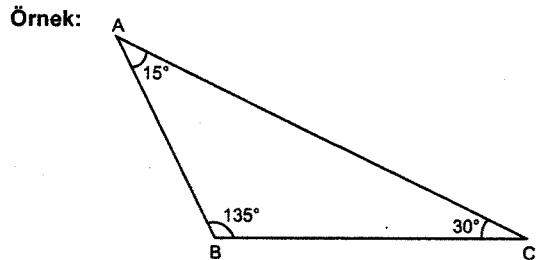
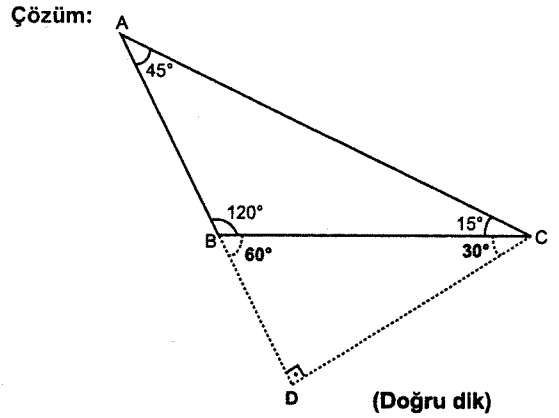
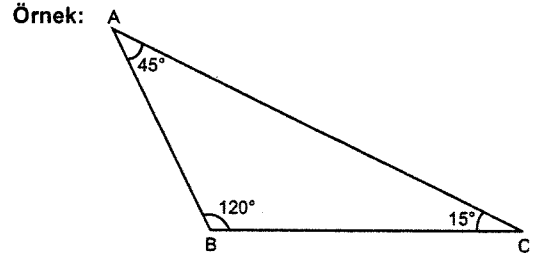
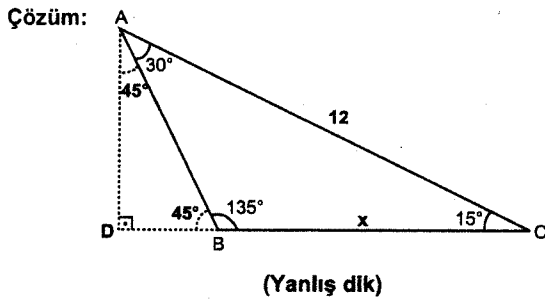
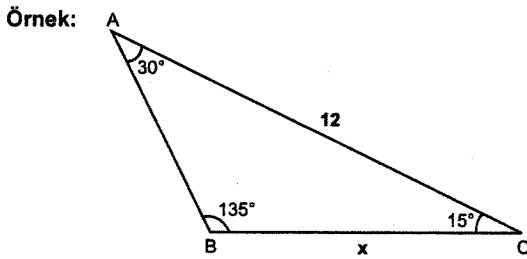
$x = ?$

Cevap: 4

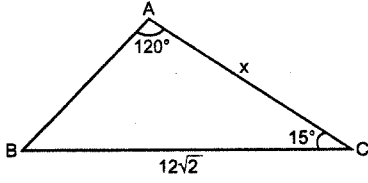


Bu tip sorularda arkada oluşan üçgen ile büyük üçgen (30-60-90 ve 45-45-90) çıkıyorsa doğru yere dik indirdik demektir.

15-75-90 üçgeni çıkıyorsa yanlış yere dik indirdik demektir.



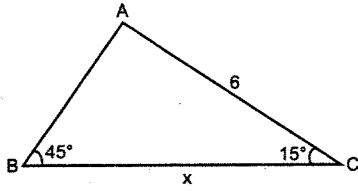
93.



$$x = ?$$

$$\text{Cevap: } 8\sqrt{3}$$

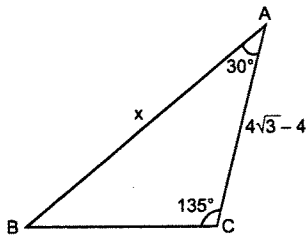
94.



$$x = ?$$

$$\text{Cevap: } 3\sqrt{6}$$

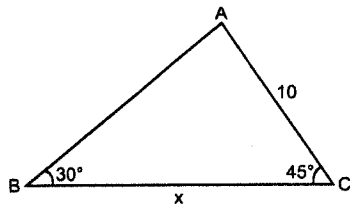
95.



$$x = ?$$

$$\text{Cevap: } 8$$

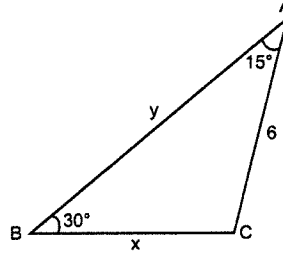
96.



$$x = ?$$

$$\text{Cevap: } 5\sqrt{6} + 5\sqrt{2}$$

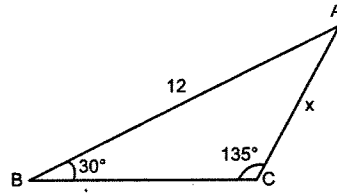
97.



$$x + y = ?$$

$$\text{Cevap: } 3\sqrt{2} + 3\sqrt{6}$$

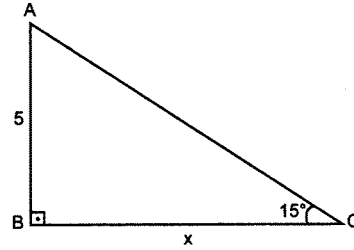
98.



$$x = ?$$

$$\text{Cevap: } 6\sqrt{2}$$

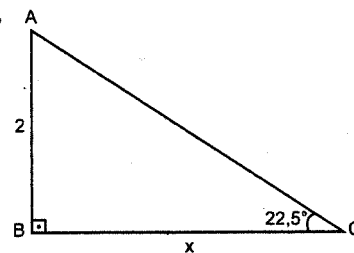
99.



$$x = ?$$

$$\text{Cevap: } 5\sqrt{3} + 10$$

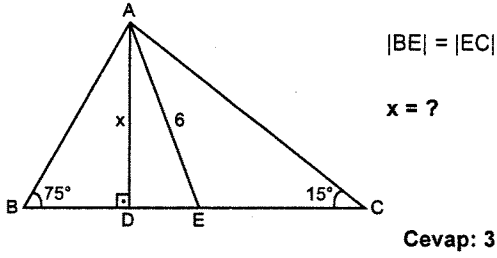
100.



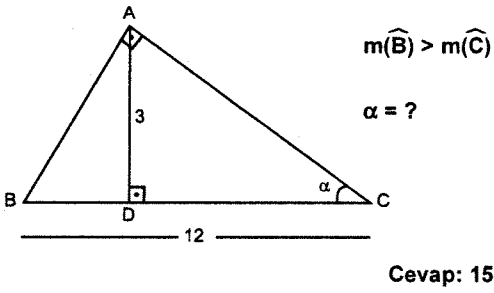
$$x = ?$$

$$\text{Cevap: } 2 + 2\sqrt{2}$$

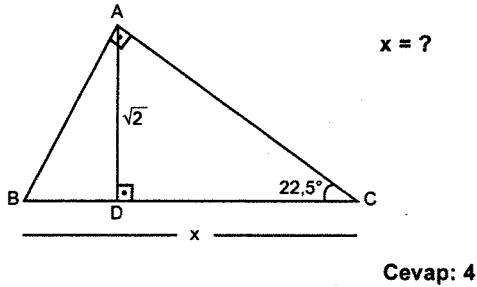
101.



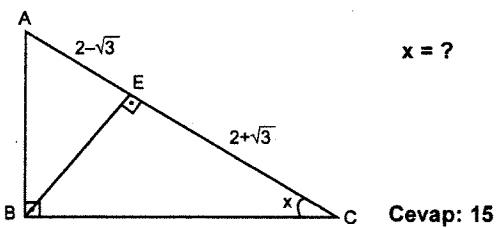
102.



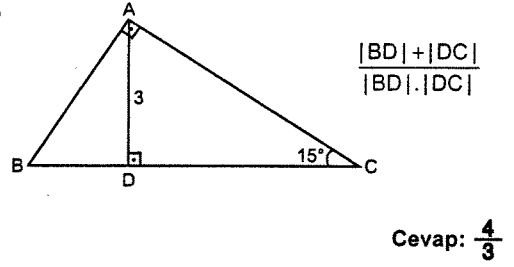
103.



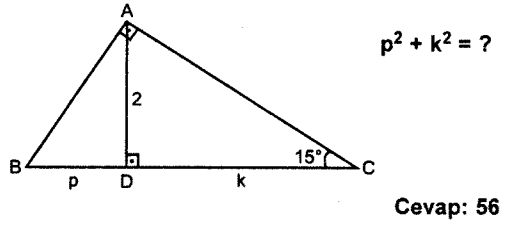
104.



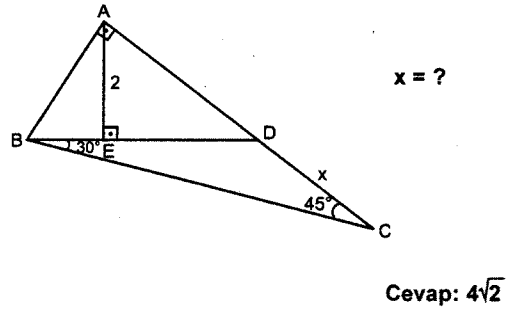
105.



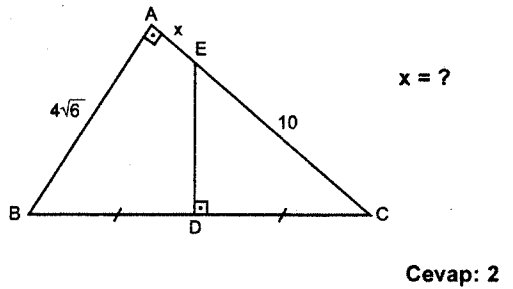
106.



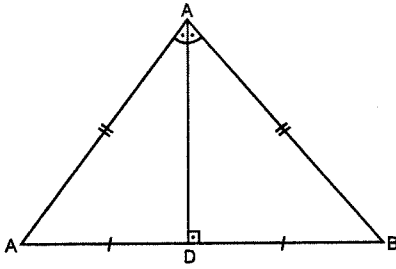
107.



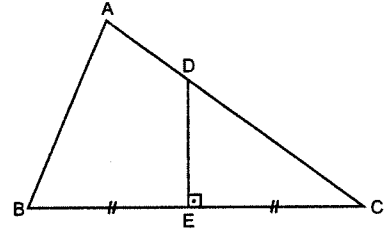
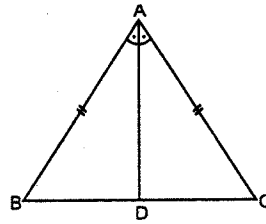
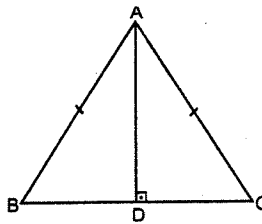
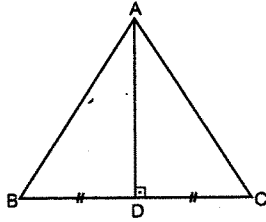
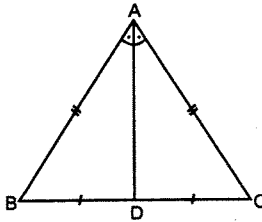
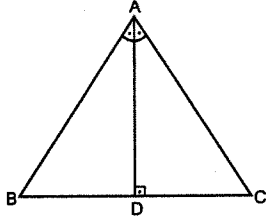
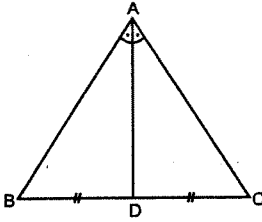
108.



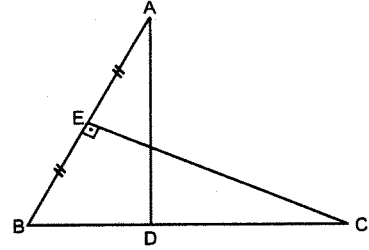
*



Aşağıdaki şekiller yukarıdaki şekle dönüştürülür.



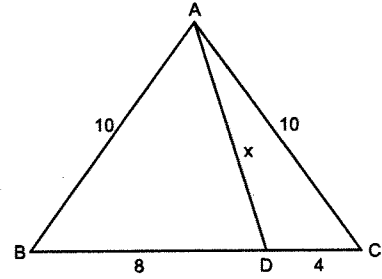
(B ile D birleştirilir.)



(A ile C birleştirilir.)

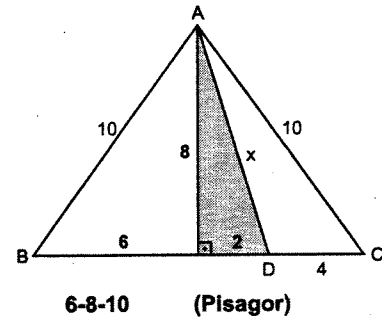
* Kenarları verilen tüm ikizkenar üçgenler için tepeden tabana dik indirin ve yukarıdaki şekle dönüştürün.

Örnek:

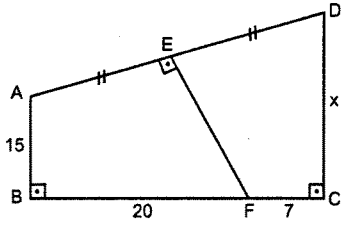


(gibi)

Çözüm:



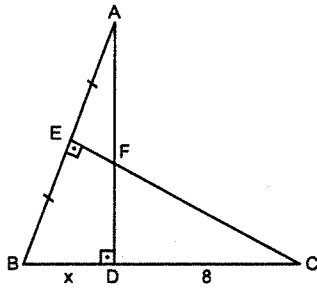
109.



$x = ?$

Cevap: 24

110.

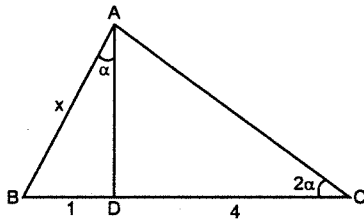


$|AD| = 15$

$x = ?$

Cevap: 9

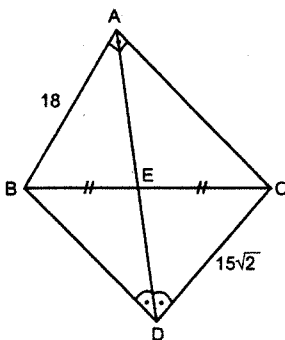
111.



$x = ?$

Cevap: $\sqrt{10}$

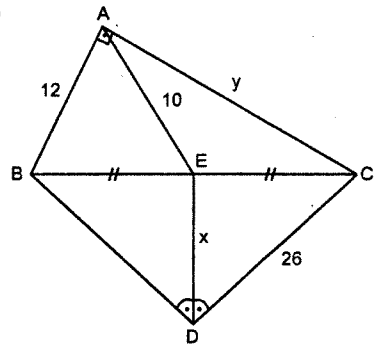
112.



$|AD| = ?$

Cevap: $21\sqrt{2}$

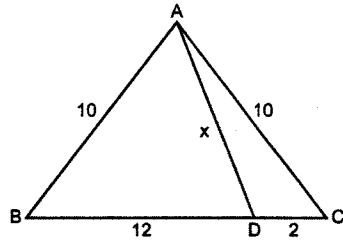
113.



$x - y = ?$

Cevap: 8

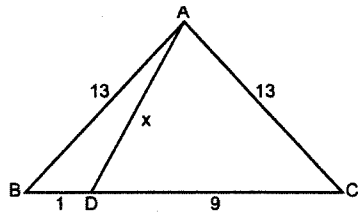
114.



$x = ?$

Cevap: $2\sqrt{19}$

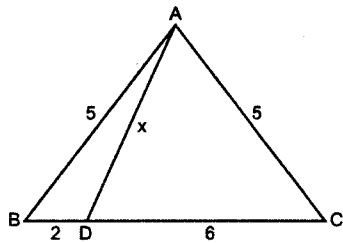
115.



$x = ?$

Cevap: $4\sqrt{10}$

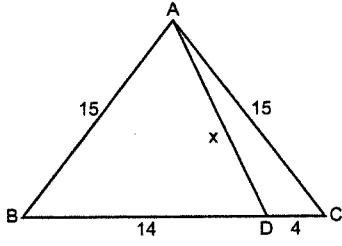
116.



$x = ?$

Cevap: $\sqrt{13}$

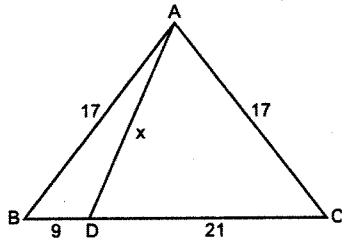
117.



$x = ?$

Cevap: 13

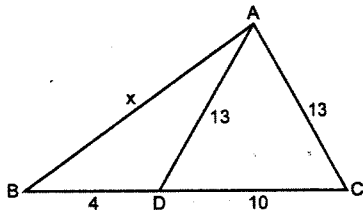
118.



$x = ?$

Cevap: 10

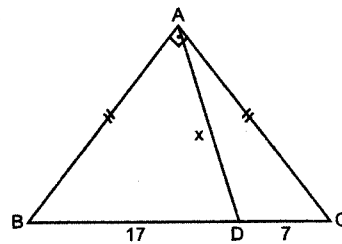
119.



$x = ?$

Cevap: 15

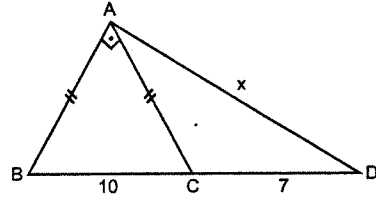
120.



$x = ?$

Cevap: 13

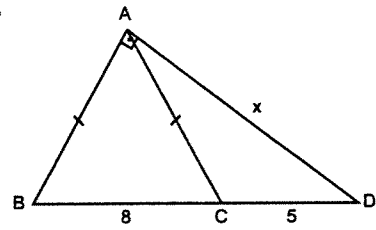
121.



$x = ?$

Cevap: 13

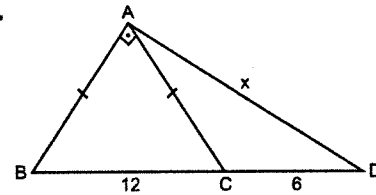
122.



$x = ?$

Cevap: $3\sqrt{13}$

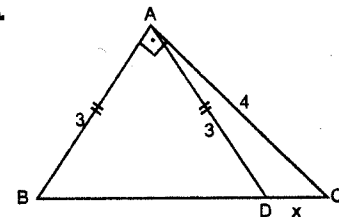
123.



$x = ?$

Cevap: $6\sqrt{5}$

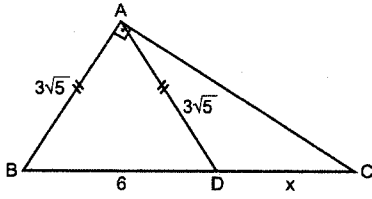
124.



$x = ?$

Cevap: 1,4

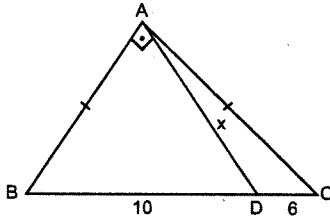
125.



$x = ?$

Cevap: 9

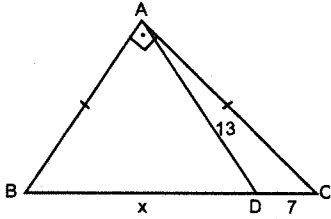
126.



$x = ?$

Cevap: $2\sqrt{5}$

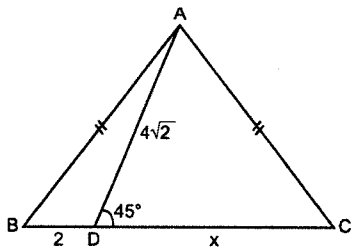
127.



$x = ?$

Cevap: 17

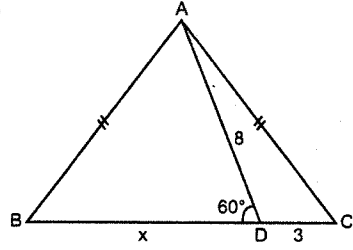
128.



$x = ?$

Cevap: 10

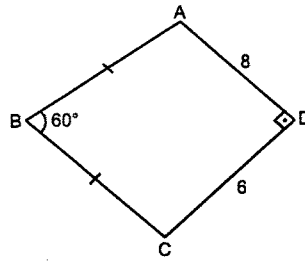
129.



$x = ?$

Cevap: 11

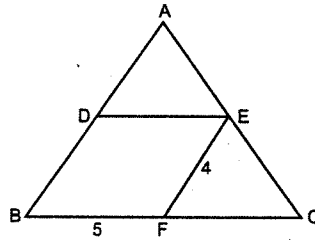
130.



Çevre(ABCD)

Cevap: 34

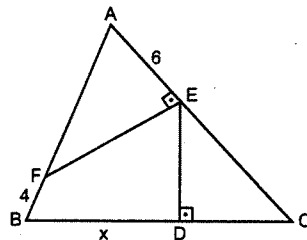
131.

ADE ve FEC
eşkenar üçgen

$\widehat{ABC} = ?$

Cevap: 27

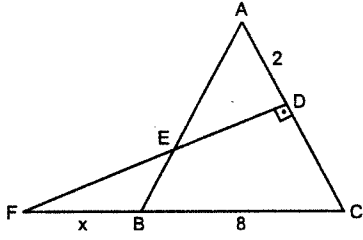
132.

ABC eşkenar
üçgen

$x = ?$

Cevap: 11

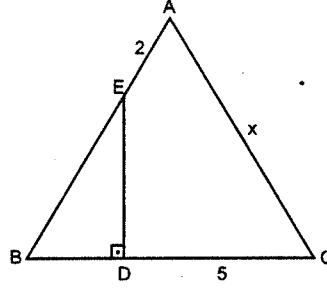
133.

ABC eşkenar
üçgen

$x = ?$

Cevap: 4

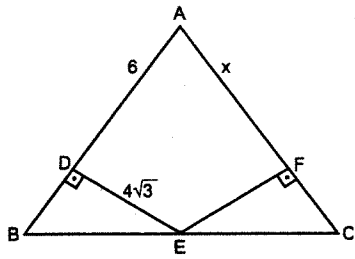
137.

ABC eşkenar
üçgen

$x = ?$

Cevap: 8

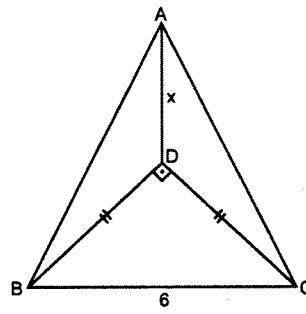
134.

ABC eşkenar
üçgen

$x = ?$

Cevap: 9

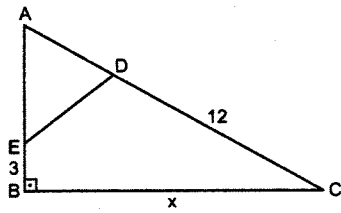
138.

ABC eşkenar
üçgen

$x = ?$

Cevap: $3\sqrt{3} - 3$

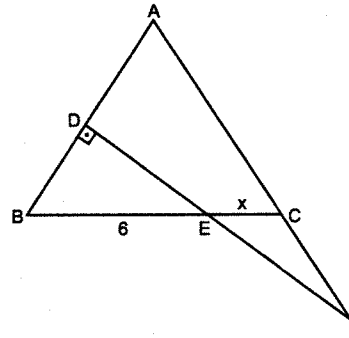
135.

ADE eşkenar
üçgen

$x = ?$

Cevap: $9\sqrt{3}$

139.

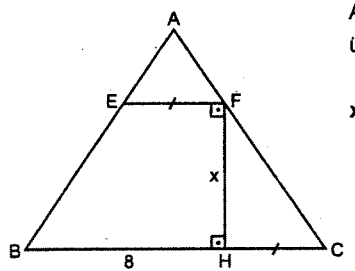
ABC eşkenar
üçgen

$|AF| = 14 \text{ cm}$

$x = ?$

Cevap: 4

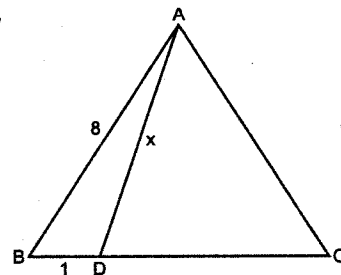
136.

ABC eşkenar
üçgen

$x = ?$

Cevap: $4\sqrt{3}$

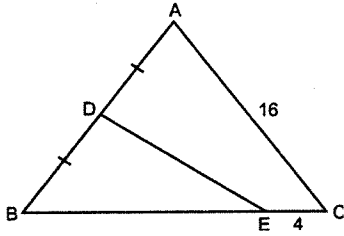
140.

ABC eşkenar
üçgen

$x = ?$

Cevap: $\sqrt{57}$

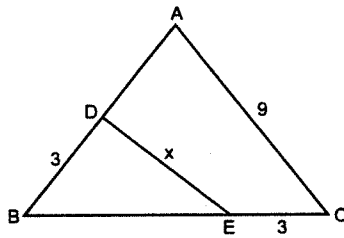
141.

ABC eşkenar
üçgen

$x = ?$

Cevap: $4\sqrt{7}$

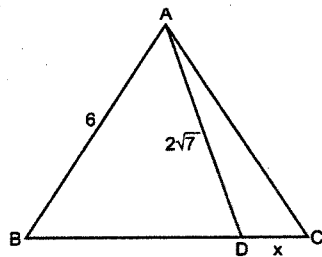
142.

ABC eşkenar
üçgen

$x = ?$

Cevap: $3\sqrt{3}$

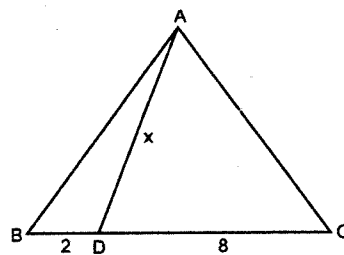
143.

ABC eşkenar
üçgen

$x = ?$

Cevap: 2

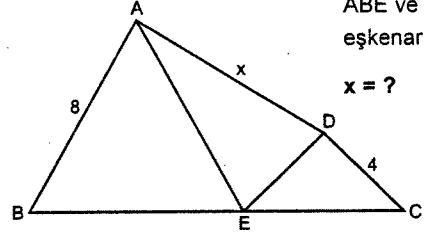
144.

ABC eşkenar
üçgen

$x = ?$

Cevap: $2\sqrt{21}$

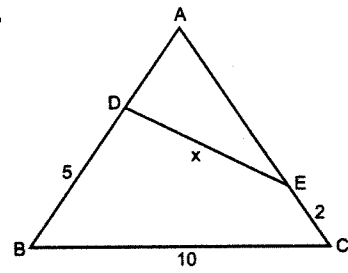
145.

ABE ve DEC
eşkenar üçgen

$x = ?$

Cevap: $4\sqrt{3}$

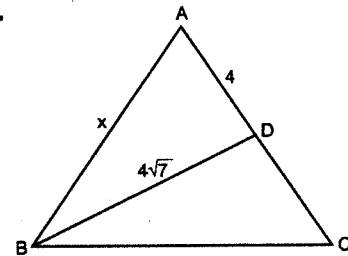
146.

ABC eşkenar
üçgen

$x = ?$

Cevap: 7

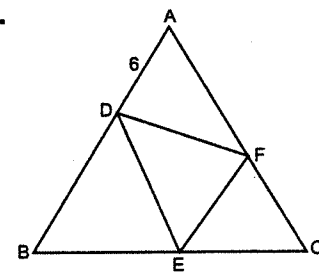
147.

ABC eşkenar
üçgen

$x = ?$

Cevap: 12

148.

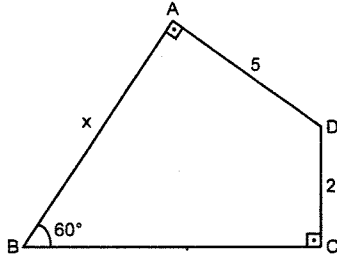
ABC ve DEF
eşkenar üçgen

$\widehat{C}(\widehat{ABC}) = 54$

$\widehat{C}(\widehat{DEF}) = ?$

Cevap: $18\sqrt{3}$

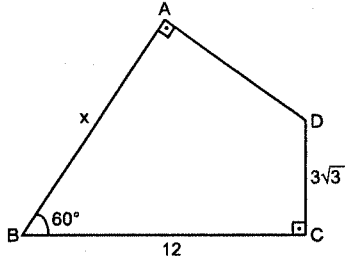
149.



$x = ?$

Cevap: $3\sqrt{3}$

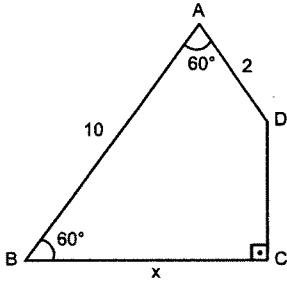
150.



$x = ?$

Cevap: $\frac{21}{2}$

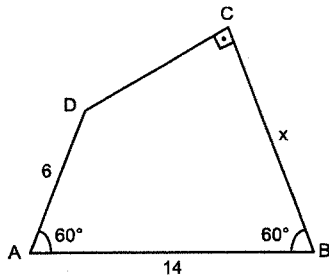
151.



$x = ?$

Cevap: 6

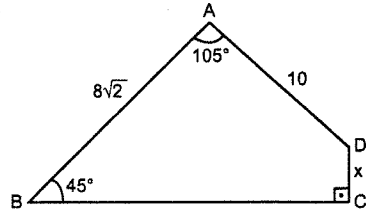
152.



$x = ?$

Cevap: 10

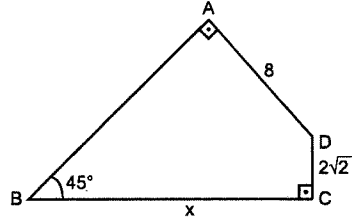
153.



$x = ?$

Cevap: 3

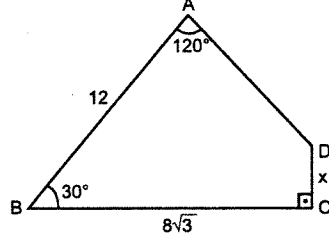
154.



$x = ?$

Cevap: $10\sqrt{2}$

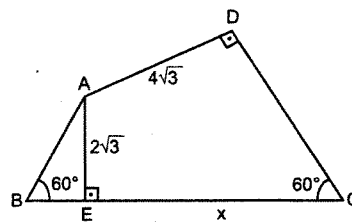
155.



$x = ?$

Cevap: 4

156.

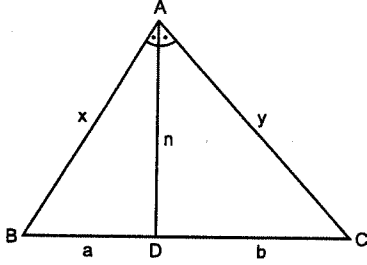


$x = ?$

Cevap: 10

ÜÇGENDE AÇIORTAY ÖZELLİKLERİ

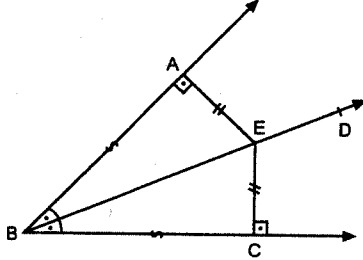
İç Açıortay Özelliği:



$$\frac{x}{y} = \frac{a}{b} \text{ veya } \frac{x}{a} = \frac{y}{b}$$

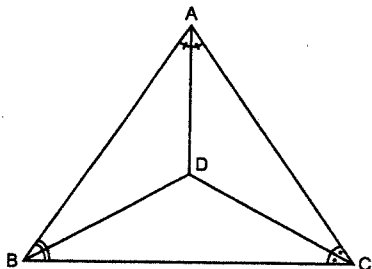
$$n^2 = x \cdot y - a \cdot b$$

* Açıortayın kollarına indirilen dikmeler birbirine eşittir.

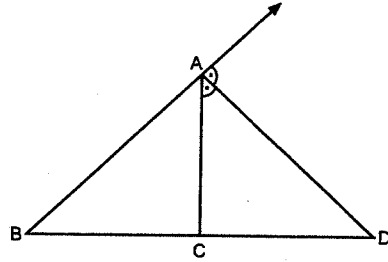


$$|AE| = |AF| \text{ ve } |AB| = |AC|$$

* Açıortaylar bir noktada kesişir. Bu noktaya bu üçgenin iç teğet çemberinin merkezi denir. Bu üç iç açıortaydan herhangi ikisi var ise üçüncü açıortay da bu noktadan geçmek zorundadır.



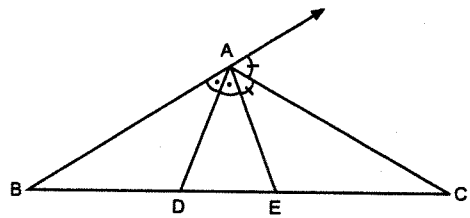
* **Dış Açıortay Özelliği:**



[AD] : Dış açıortay

$$\frac{|AB|}{|BD|} = \frac{|AC|}{|CD|}$$

*



Yukarıdaki şekil için:

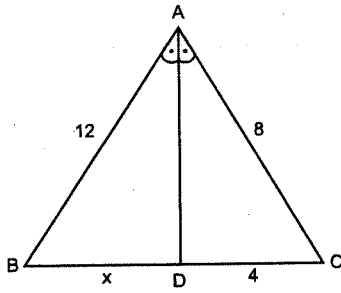
a) $m(\widehat{DAC}) = 90^\circ$

b) $\frac{|AB|}{|AE|} = \frac{|BD|}{|DE|}$ (İç açıortay özelliği)

c) $\frac{|AB|}{|BC|} = \frac{|AE|}{|EC|}$ (Dış açıortay özelliği)

uygulanır.

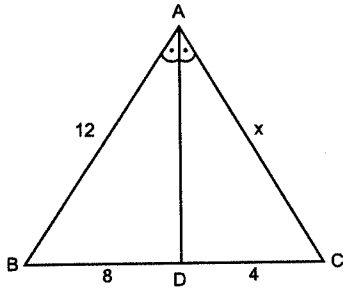
1.



$$x = ?$$

Cevap: 6

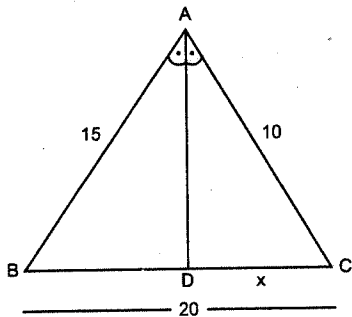
2.



$$x = ?$$

Cevap: 6

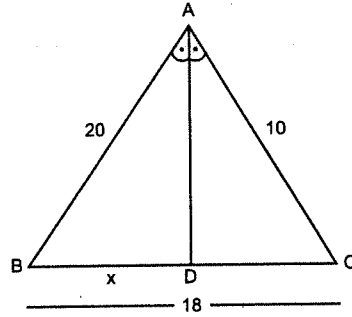
3.



$$x = ?$$

Cevap: 8

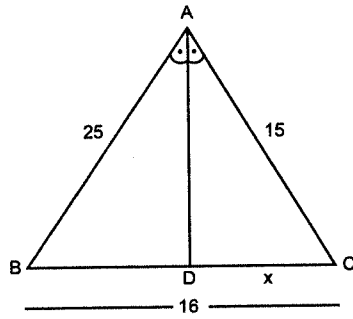
4.



$$x = ?$$

Cevap: 12

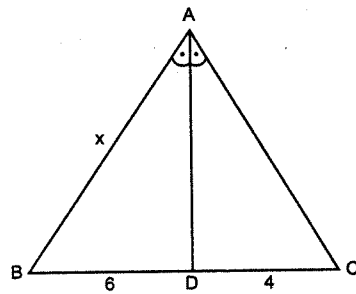
5.



$$x = ?$$

Cevap: 6

6.

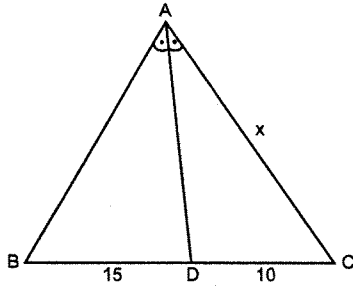


$$\widehat{C(ABC)} = 25$$

$$x = ?$$

Cevap: 9

7.

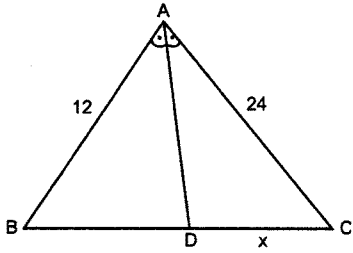


$$\widehat{\angle ABC} = 60$$

$$x = ?$$

Cevap: 14

8.

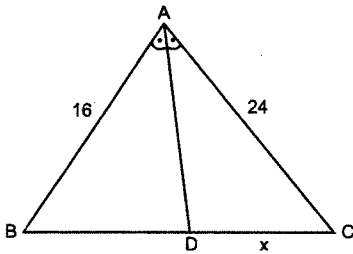


$$\widehat{\angle ABC} = 51$$

$$x = ?$$

Cevap: 10

9.

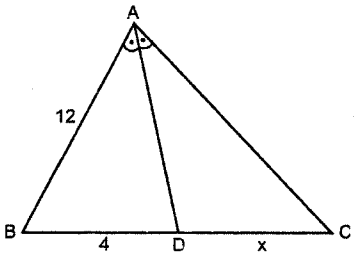


$$\widehat{\angle ABC} = 60$$

$$x = ?$$

Cevap: 12

10.

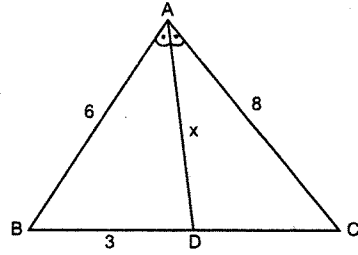


$$\widehat{\angle ABC} = 40$$

$$x = ?$$

Cevap: 6

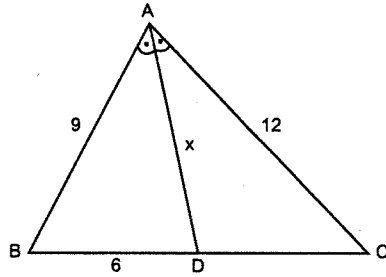
11.



$$x = ?$$

Cevap: 6

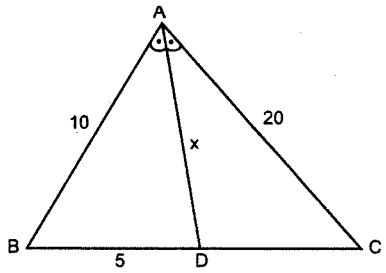
12.



$$x = ?$$

Cevap: $2\sqrt{15}$

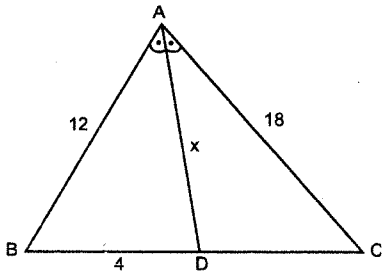
13.



$$x = ?$$

Cevap: $5\sqrt{6}$

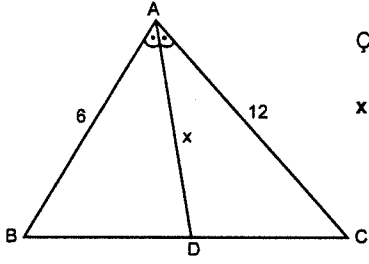
14.



$$x = ?$$

Cevap: $8\sqrt{3}$

15.

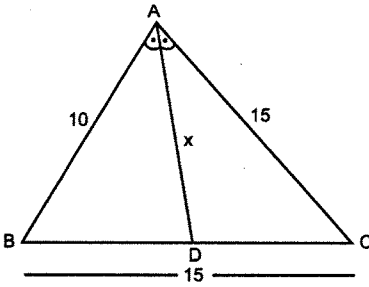


$$\angle(ABC) = 30$$

$$x = ?$$

$$\text{Cevap: } 2\sqrt{10}$$

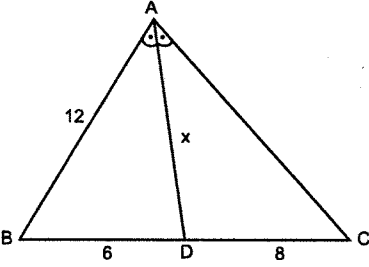
16.



$$x = ?$$

$$\text{Cevap: } 4\sqrt{6}$$

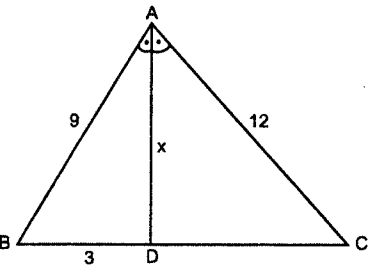
17.



$$x = ?$$

$$\text{Cevap: } 12$$

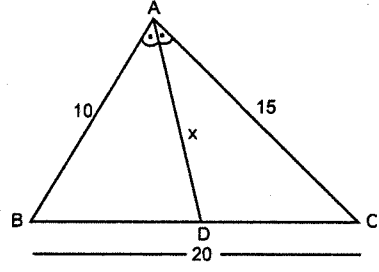
18.



$$x = ?$$

$$\text{Cevap: } 4\sqrt{6}$$

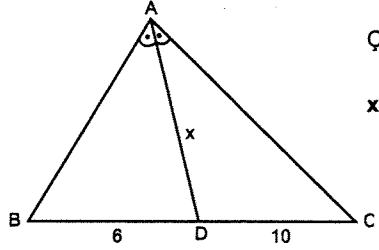
19.



$$x = ?$$

$$\text{Cevap: } 3\sqrt{6}$$

20.

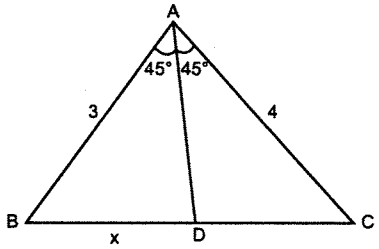


$$\angle(ABC) = 48$$

$$x = ?$$

$$\text{Cevap: } 6\sqrt{5}$$

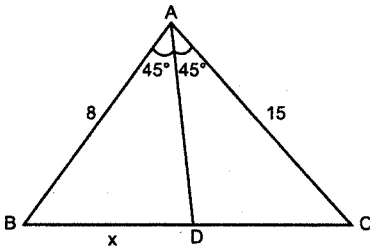
21.



$$x = ?$$

$$\text{Cevap: } \frac{15}{7}$$

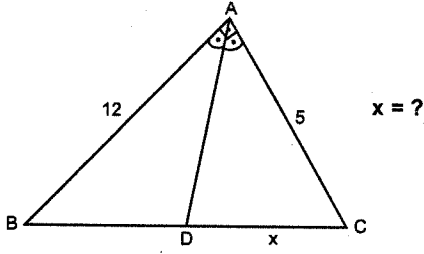
22.



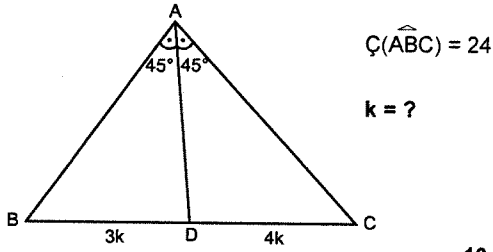
$$x = ?$$

$$\text{Cevap: } \frac{136}{23}$$

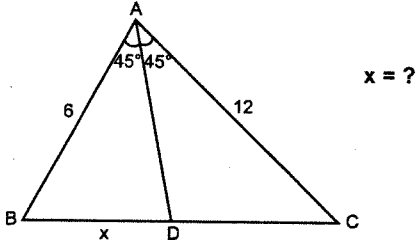
23.

Cevap: $\frac{65}{17}$

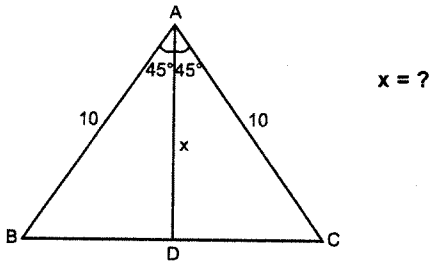
24.

Cevap: $\frac{10}{7}$

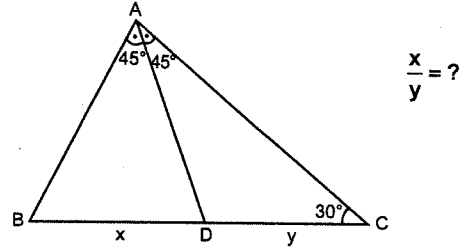
25.

Cevap: $2\sqrt{5}$

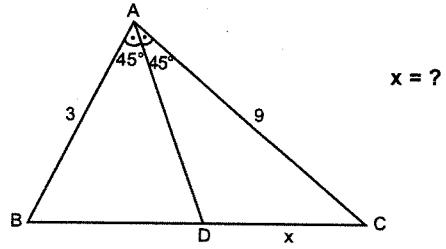
26.

Cevap: $5\sqrt{2}$

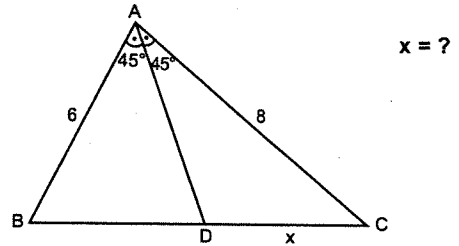
27.

Cevap: $\frac{1}{\sqrt{3}}$

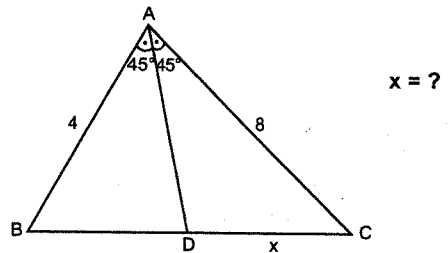
28.

Cevap: $\frac{9\sqrt{10}}{4}$

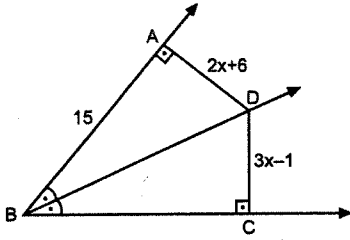
29.

Cevap: $\frac{40}{7}$

30.

Cevap: $\frac{8\sqrt{5}}{3}$

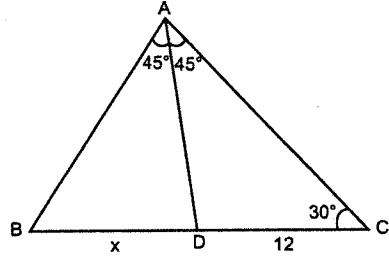
31.



$|BD| = ?$

Cevap: 25

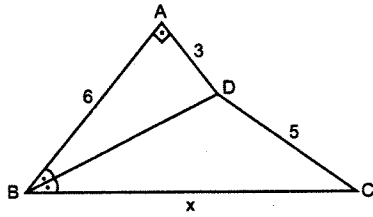
35.



$x = ?$

Cevap: $4\sqrt{3}$

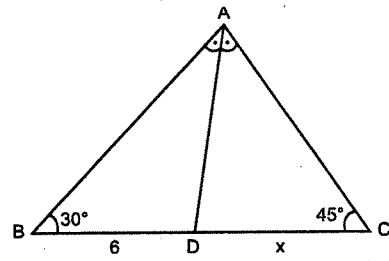
32.



$x = ?$

Cevap: 10

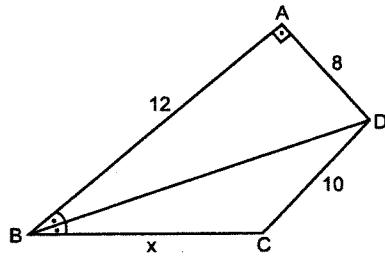
36.



$x = ?$

Cevap: $3\sqrt{2}$

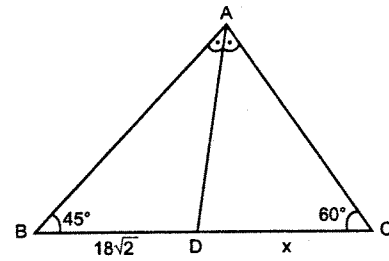
33.



$x = ?$

Cevap: 6

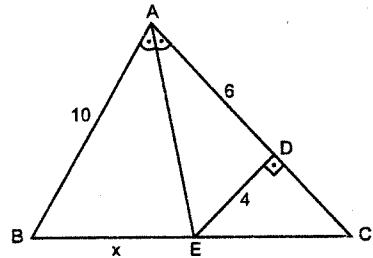
37.



$x = ?$

Cevap: $12\sqrt{3}$

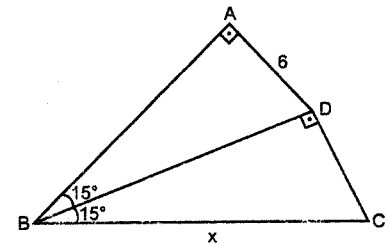
34.



$x = ?$

Cevap: $4\sqrt{2}$

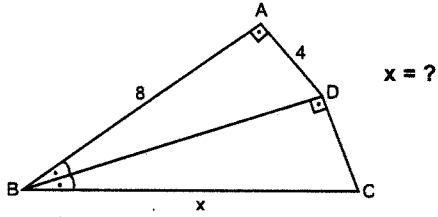
38.



$x = ?$

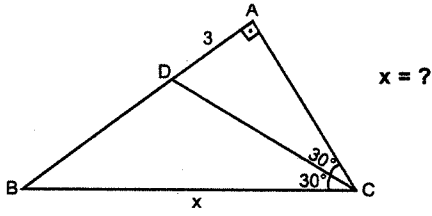
Cevap: 24

39.

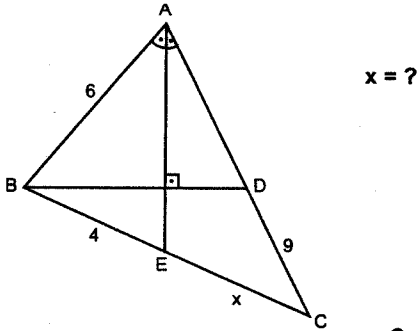


Cevap: 10

40.

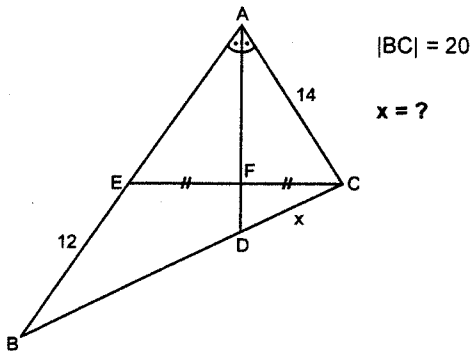
Cevap: $6\sqrt{3}$

41.



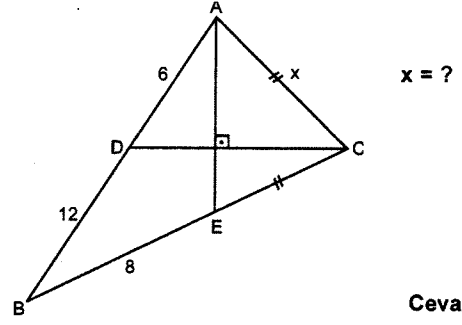
Cevap: 10

42.



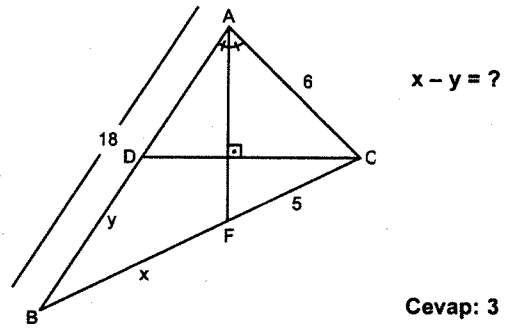
Cevap: 7

43.



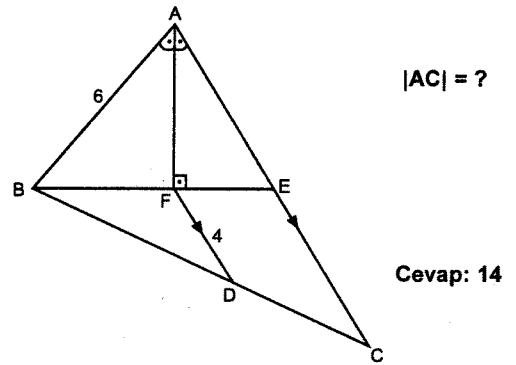
Cevap: 8

44.



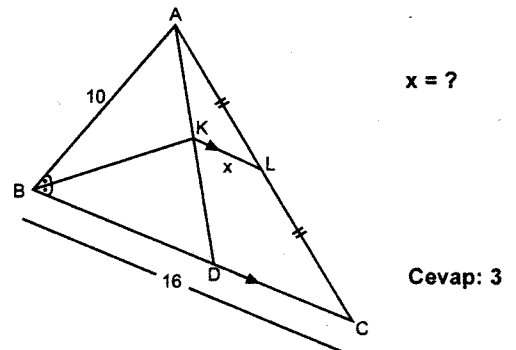
Cevap: 3

45.



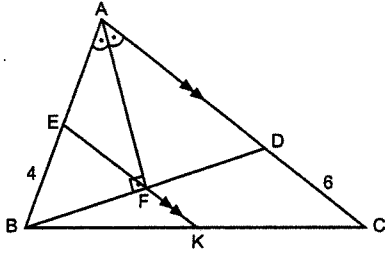
Cevap: 14

46.



Cevap: 3

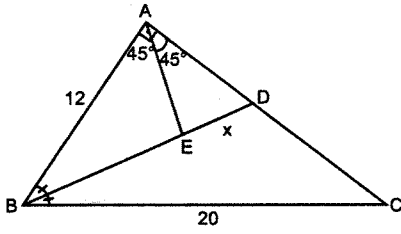
47.



$|EK| = ?$

Cevap: 7

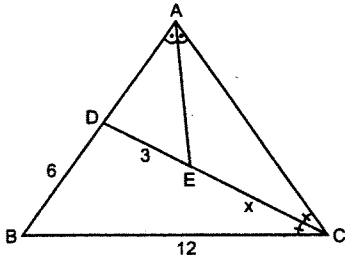
48.



$x = ?$

Cevap: $2\sqrt{5}$

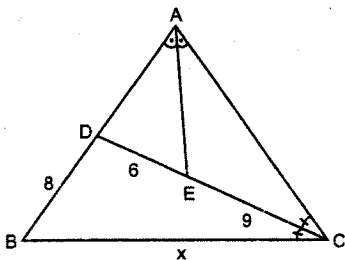
49.



$x = ?$

Cevap: 6

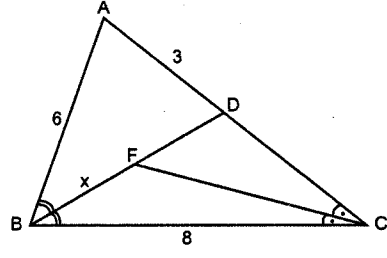
50.



$x = ?$

Cevap: 12

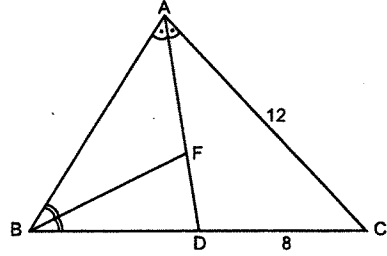
51.



$x = ?$

Cevap: 4

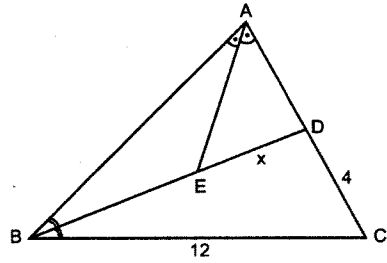
52.



$\frac{|AF|}{|FD|} = ?$

Cevap: $\frac{3}{2}$

53.

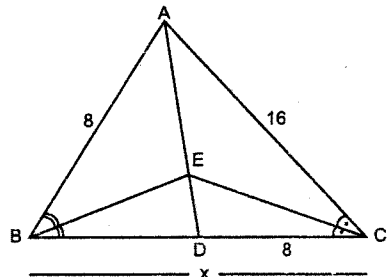


$|BD| = 12$

$x = ?$

Cevap: 3

54.

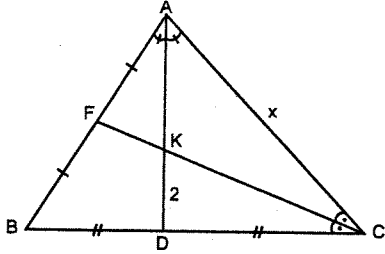


$\frac{|AE|}{|ED|} = \frac{4}{3}$

$x = ?$

Cevap: 18

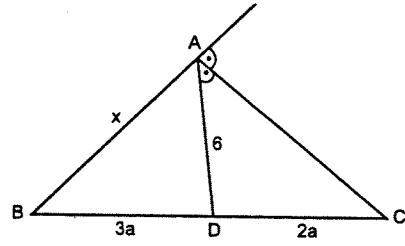
55.



$x = ?$

Cevap: $4\sqrt{3}$

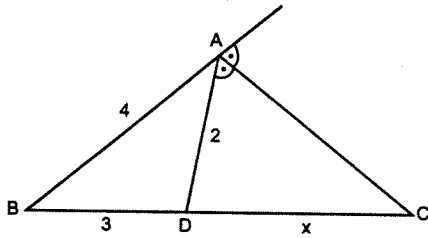
59.



$x = ?$

Cevap: 15

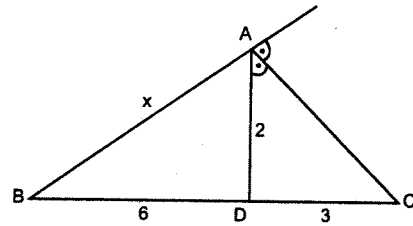
56.



$x = ?$

Cevap: 3

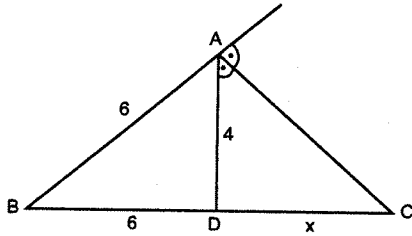
60.



$x = ?$

Cevap: 6

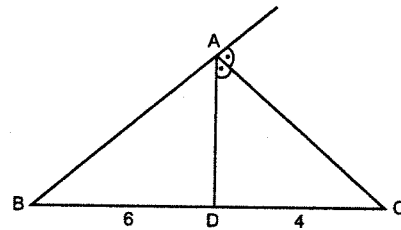
57.



$x = ?$

Cevap: 12

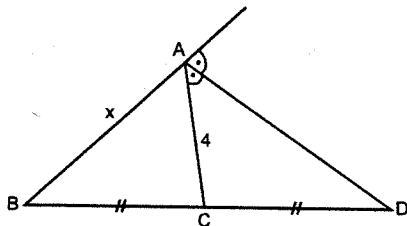
61.



$\frac{|AB|}{|AD|} = ?$

Cevap: $\frac{5}{2}$

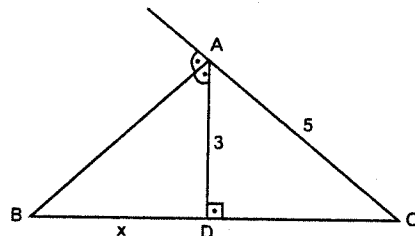
58.



$x = ?$

Cevap: 8

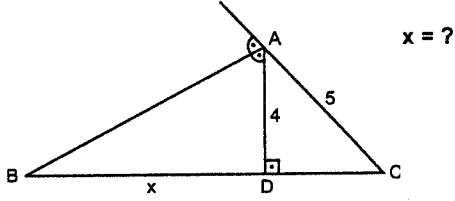
62.



$x = ?$

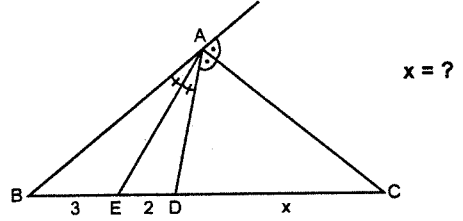
Cevap: 6

63.

 $x = ?$

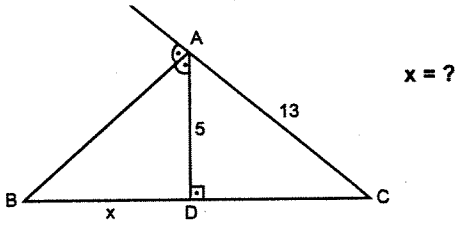
Cevap: 12

67.

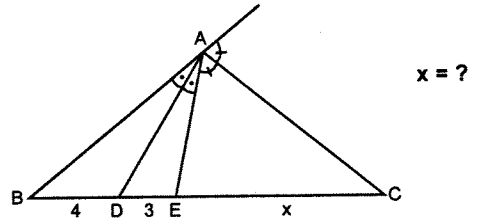
 $x = ?$

Cevap: 10

64.

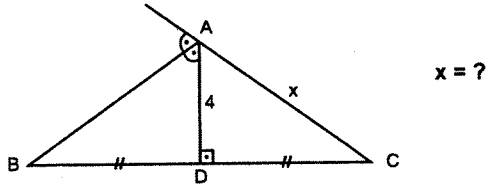
 $x = ?$ Cevap: $\frac{15}{2}$

68.

 $x = ?$

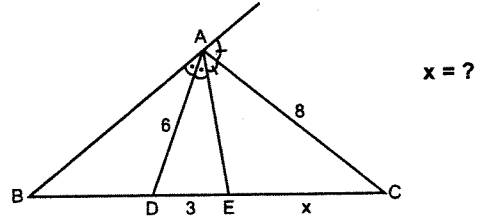
Cevap: 21

65.

 $x = ?$

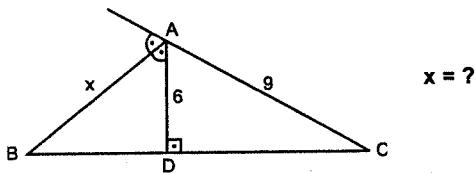
Cevap: 8

69.

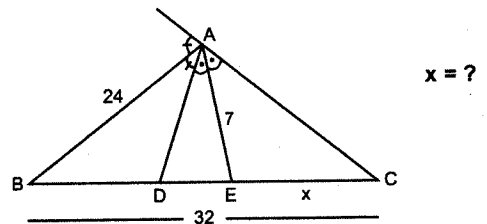
 $x = ?$

Cevap: 7

66.

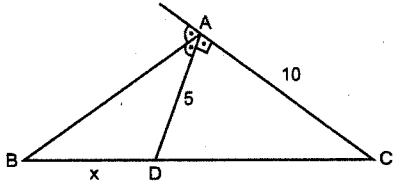
 $x = ?$ Cevap: $6\sqrt{6}$

70.

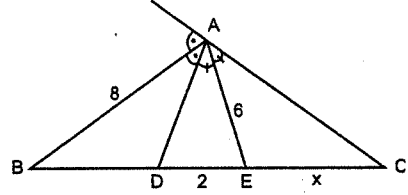
 $x = ?$

Cevap: 7

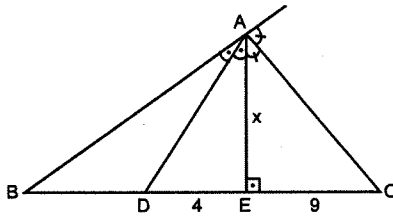
71.

 $x = ?$ Cevap: $5\sqrt{5}$

75.

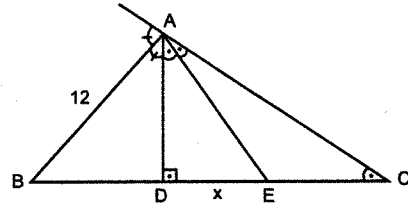
 $x = ?$ Cevap: $\frac{10}{3}$

72.

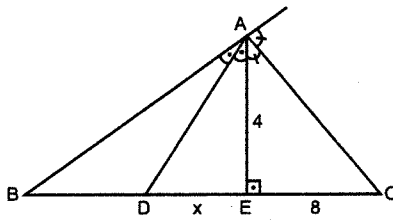
 $x = ?$

Cevap: 6

76.

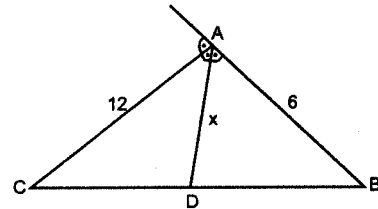
 $x = ?$ Cevap: $2\sqrt{3}$

73.

 $x = ?$

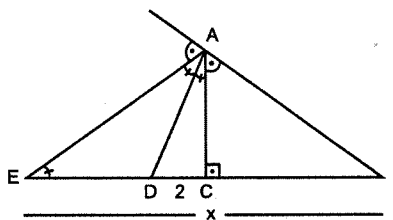
Cevap: 2

77.

 $x = ?$

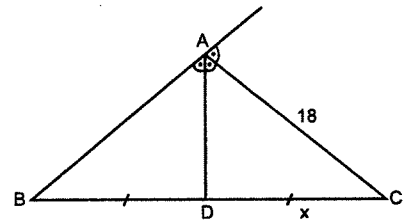
Cevap: 4

74.

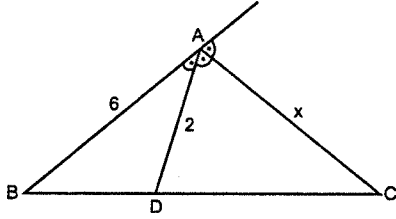
 $x = ?$

Cevap: 12

78.

 $x = ?$ Cevap: $9\sqrt{3}$

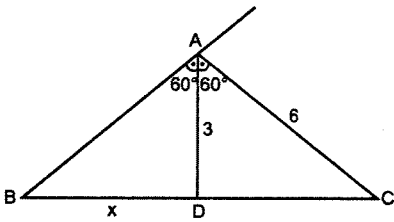
79.



$x = ?$

Cevap: 3

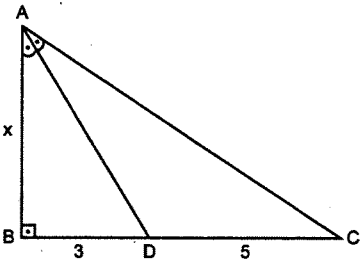
80.



$x = ?$

Cevap: $3\sqrt{3}$

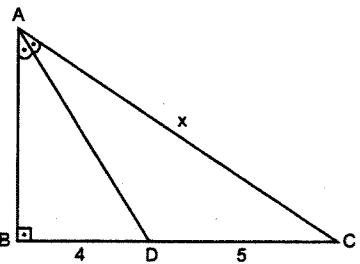
81.



$x = ?$

Cevap: 6

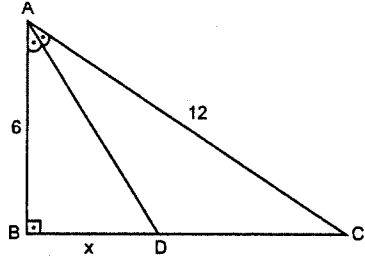
82.



$x = ?$

Cevap: 15

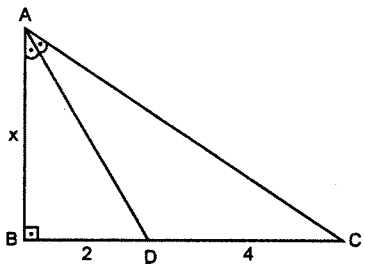
83.



$x = ?$

Cevap: $2\sqrt{3}$

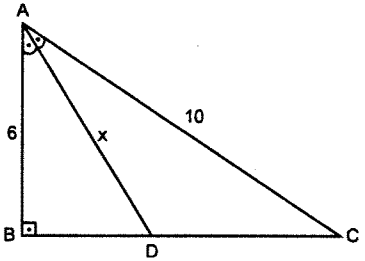
84.



$x = ?$

Cevap: $2\sqrt{3}$

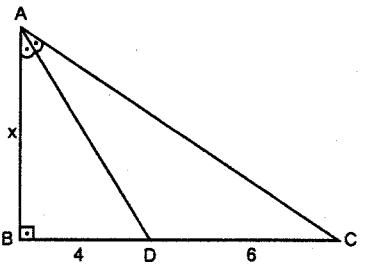
85.



$x = ?$

Cevap: $3\sqrt{5}$

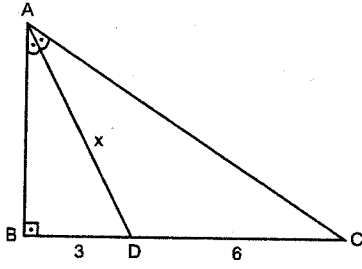
86.



$x = ?$

Cevap: $4\sqrt{5}$

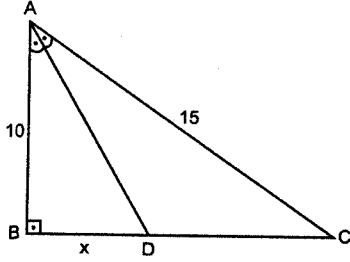
87.



$x = ?$

Cevap: 6

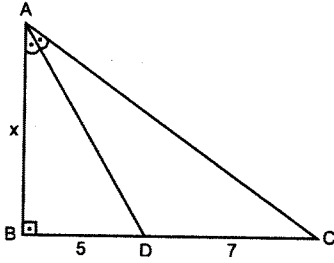
88.



$x = ?$

Cevap: $2\sqrt{5}$

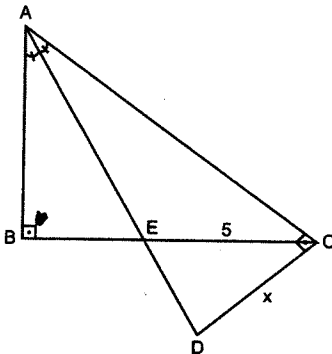
89.



$x = ?$

Cevap: $5\sqrt{6}$

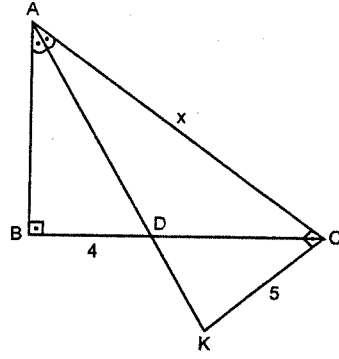
90.



$x = ?$

Cevap: 5

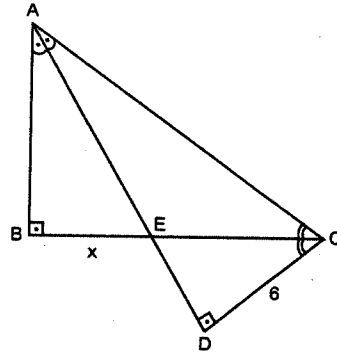
91.



$x = ?$

Cevap: 15

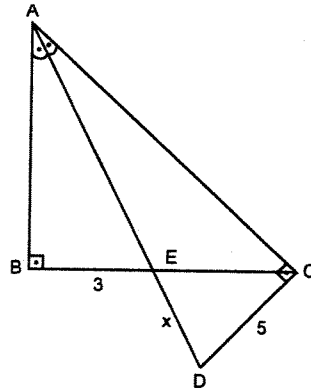
92.



$x = ?$

Cevap: $2\sqrt{3}$

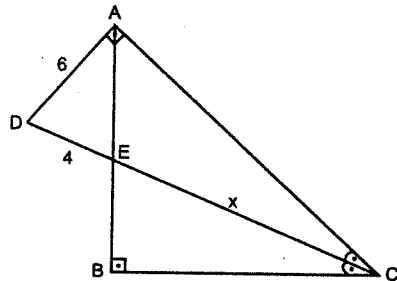
93.



$x = ?$

Cevap: $2\sqrt{5}$

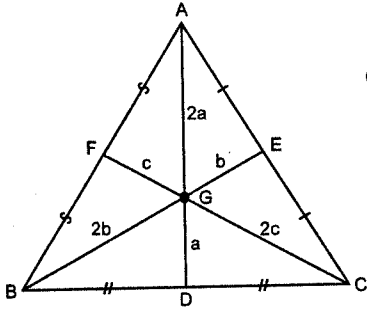
94.



$x = ?$

Cevap: 14

ÜÇGENDE KENARORTAY ÖZELLİKLERİ

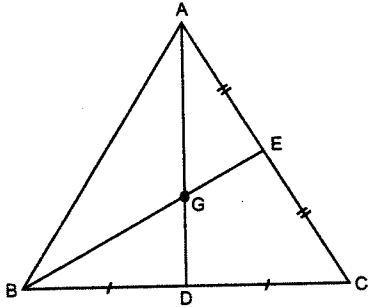


G: ağırlık merkezi

Üçgende kenarortaylar bir noktada kesişir. Bu noktaya bu üçgenin ağırlık merkezi denir. Ağırlık merkezi tabana 1 br, köşeye 2 br uzaklıktadır.

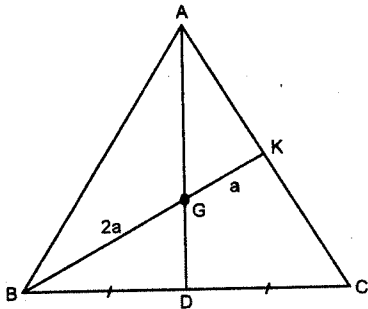
Ne zaman ağırlık merkezi olduğu anlaşılır?

İki kenarortay verildiği zaman

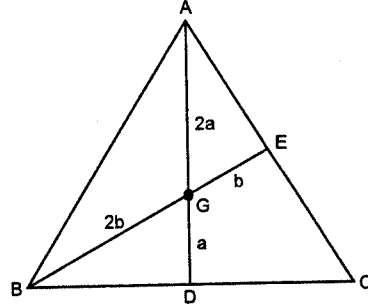


G: ağırlık merkezi

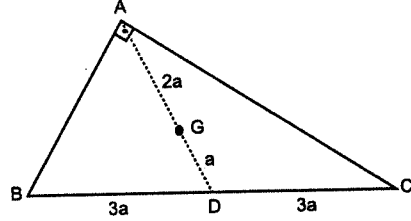
Bir kenarortay ve bir de bir'e iki oranı verilirse G ağırlık merkezi olduğu anlaşılır.



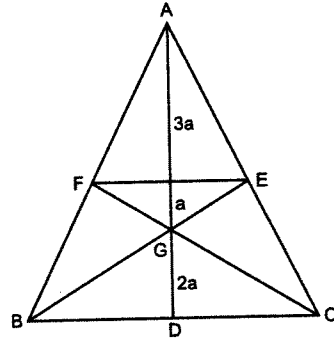
2 tane bir'e iki oranı verilirse G ağırlık merkezi olduğu anlaşılır.



* Dik üçgende ağırlık merkezi verilmişse mutlaka muhteşem üçlü oluşur.

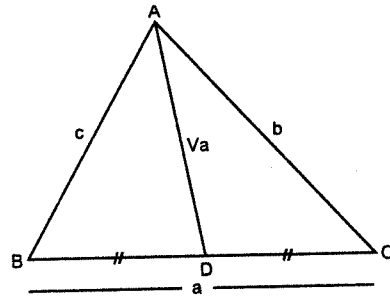


* Ankara'nın telefon kodu (312) kuralı



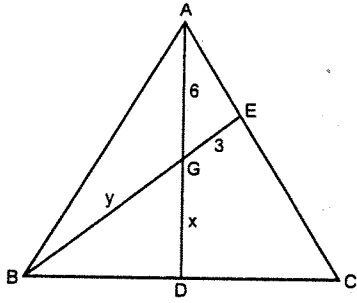
G: ağırlık merkezi

Kenarortay Teoremi



$$2.Va^2 = b^2 + c^2 - \frac{a^2}{2}$$

1.

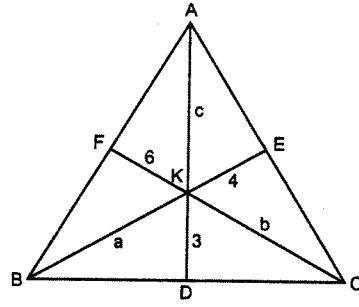


G, ağırlık merkezi

$$x + y = ?$$

Cevap: 9

4.

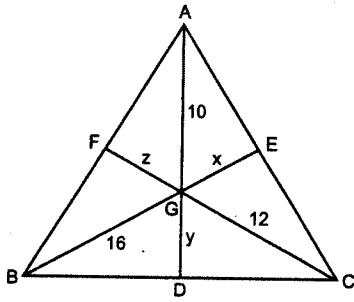


D, E, F orta noktalar

$$a + b + c = ?$$

Cevap: 26

2.

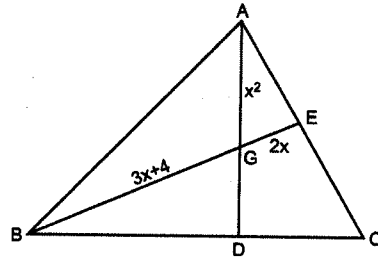


G, ağırlık merkezi

$$x + y + z = ?$$

Cevap: 19

5.

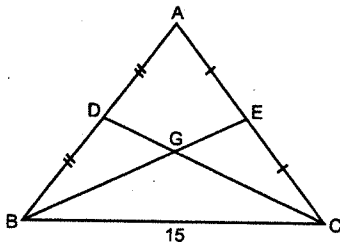


G, ağırlık merkezi

$$|GD| = ?$$

Cevap: 8

3.



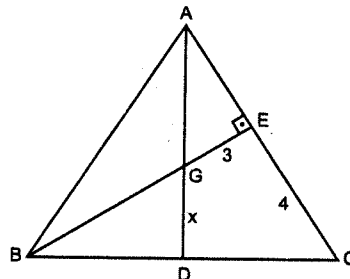
$$|BE| = 12$$

$$|DC| = 15$$

$$\widehat{GBC} = ?$$

Cevap: 33

6.

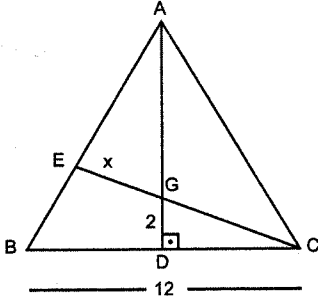


G, ağırlık merkezi

$$x = ?$$

Cevap: $\frac{5}{2}$

7.

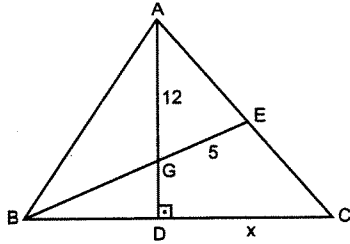


G, ağırlık merkezi

$x = ?$

Cevap: $\sqrt{10}$

8.

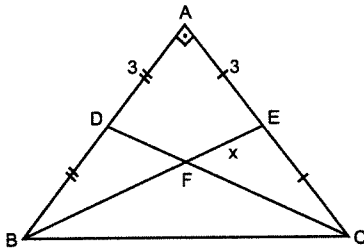


G, ağırlık merkezi

$x = ?$

Cevap: 8

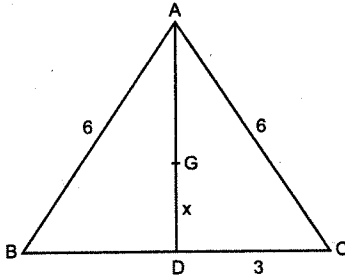
9.



$x = ?$

Cevap: $\sqrt{5}$

10.

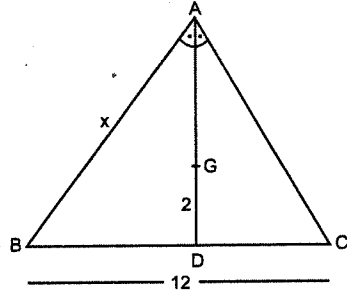


G, ağırlık merkezi

$x = ?$

Cevap: $\sqrt{3}$

11.

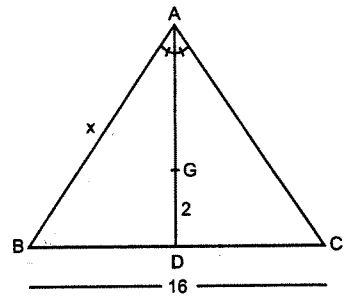


G, ağırlık merkezi

$x = ?$

Cevap: $6\sqrt{2}$

12.

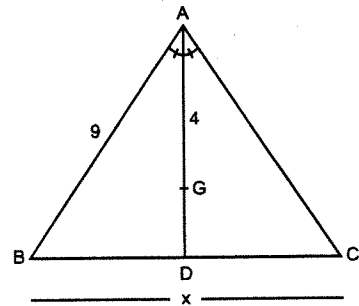


G, ağırlık merkezi

$x = ?$

Cevap: 10

13.

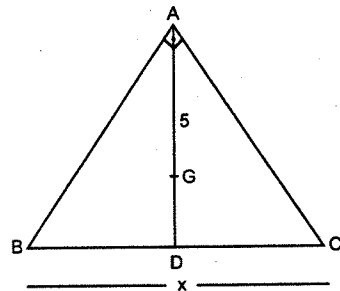


G, ağırlık merkezi

$x = ?$

Cevap: $6\sqrt{5}$

14.

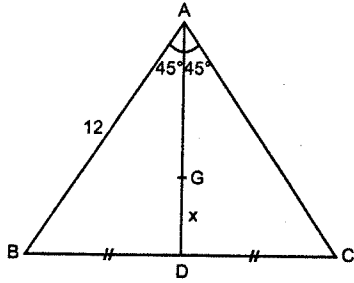


G, ağırlık merkezi

$x = ?$

Cevap: 15

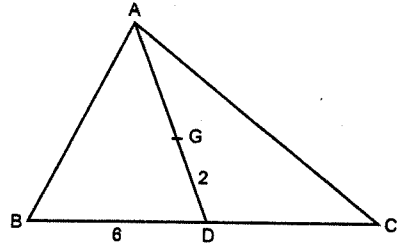
15.

G, ağırlık
merkezi

$x = ?$

Cevap: $2\sqrt{2}$

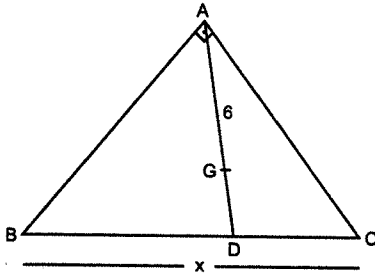
19.

G, ağırlık
merkezi

$m(\widehat{A}) = ?$

Cevap: 90°

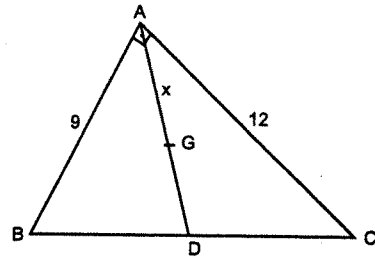
16.

G, ağırlık
merkezi

$x = ?$

Cevap: 18

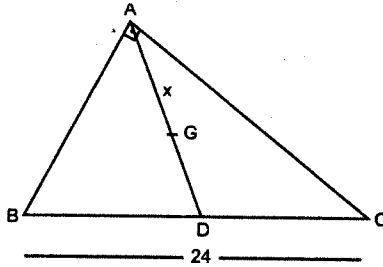
20.

G, ağırlık
merkezi

$x = ?$

Cevap: 5

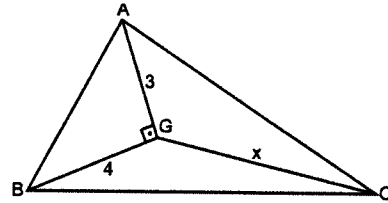
17.

G, ağırlık
merkezi

$x = ?$

Cevap: 8

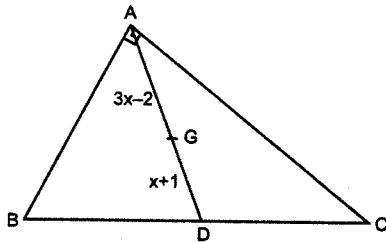
21.

G, ağırlık
merkezi

$x = ?$

Cevap: 5

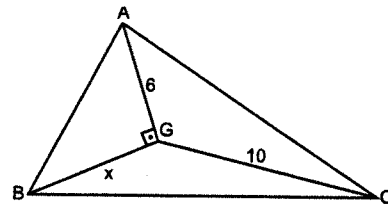
18.

G, ağırlık
merkezi

$|BC| = ?$

Cevap: 30

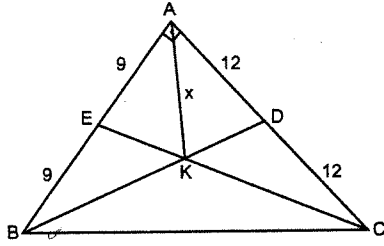
22.

G, ağırlık
merkezi

$x = ?$

Cevap: 8

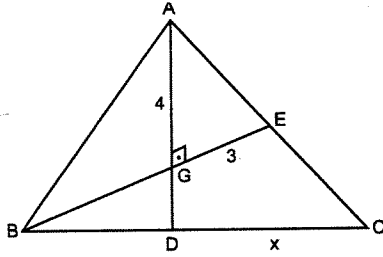
23.



$$x = ?$$

Cevap: 10

24.

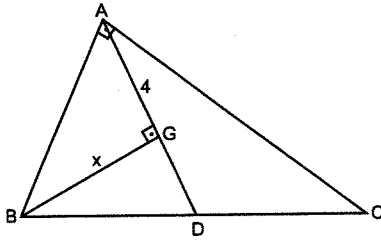


G, ağırlık merkezi

$$x = ?$$

Cevap: $2\sqrt{10}$

25.

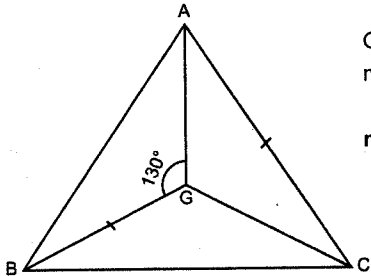


G, ağırlık merkezi

$$x = ?$$

Cevap: $4\sqrt{2}$

26.

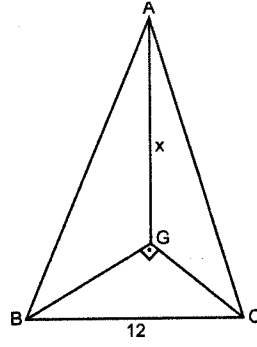


G, ağırlık merkezi

$$m(\widehat{BGC}) = ?$$

Cevap: 140°

27.

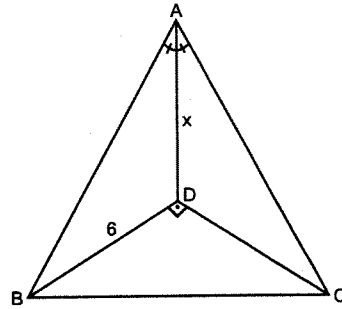


G, ağırlık merkezi

$$x = ?$$

Cevap: 12

28.

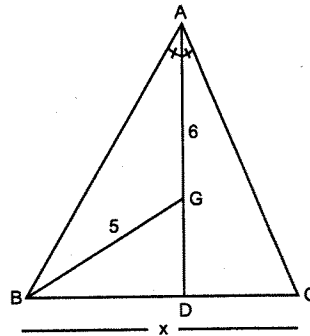


D, ağırlık merkezi

$$x = ?$$

Cevap: $6\sqrt{2}$

29.

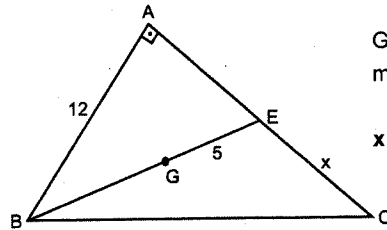


G, ağırlık merkezi

$$x = ?$$

Cevap: 8

30.

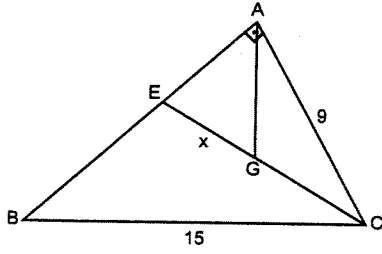


G, ağırlık merkezi

$$x = ?$$

Cevap: 9

31.

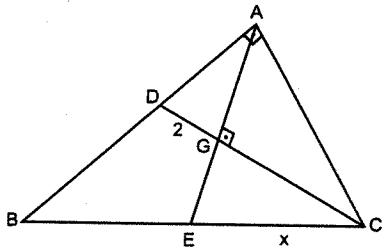


G, ağırlık merkezi

$x = ?$

Cevap: $\sqrt{13}$

32.

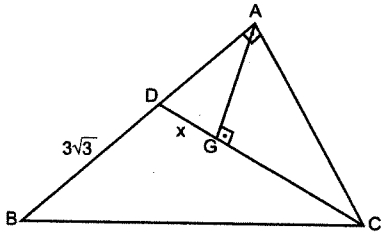


G, ağırlık merkezi

$x = ?$

Cevap: $3\sqrt{2}$

33.

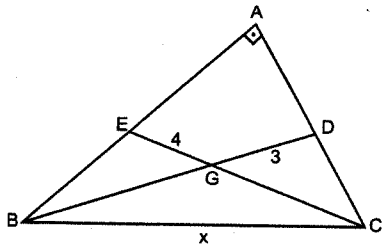


G, ağırlık merkezi

$x = ?$

Cevap: 3

34.

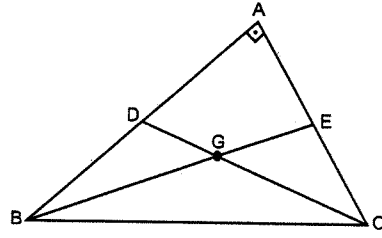


G, ağırlık merkezi

$x = ?$

Cevap: $6\sqrt{5}$

35.



G, ağırlık merkezi

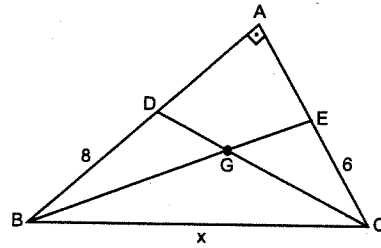
$|BE| = 7$

$|DC| = 9$

$|BC| = ?$

Cevap: $2\sqrt{26}$

36.

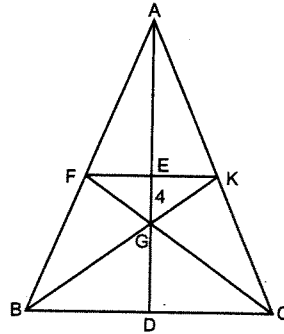


G, ağırlık merkezi

$x = ?$

Cevap: 20

37.

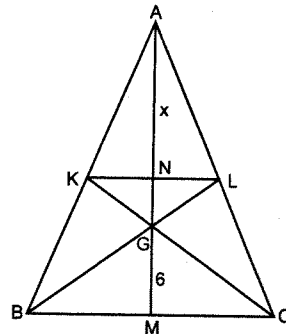


G, ağırlık merkezi

$|AD| = ?$

Cevap: 24

38.

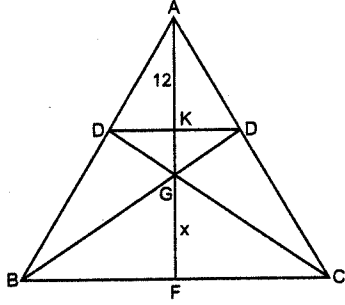


G, ağırlık merkezi

$|AN| = ?$

Cevap: 9

39.

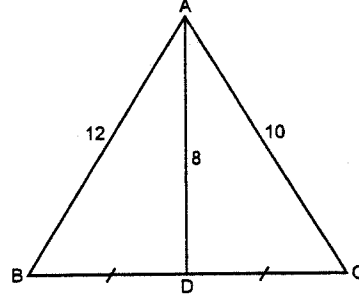


G, ağırlık merkezi

$x = ?$

Cevap: 8

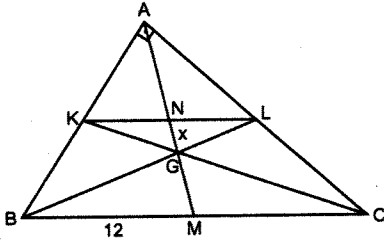
43.



$|BC| = ?$

Cevap: $2\sqrt{58}$

40.

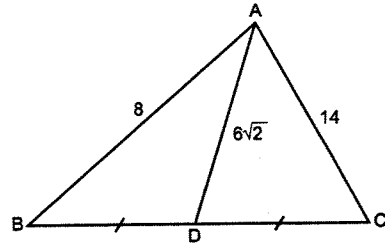


G, ağırlık merkezi

$x = ?$

Cevap: 2

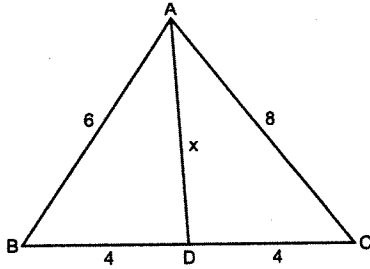
44.



$|BC| = ?$

Cevap: $2\sqrt{58}$

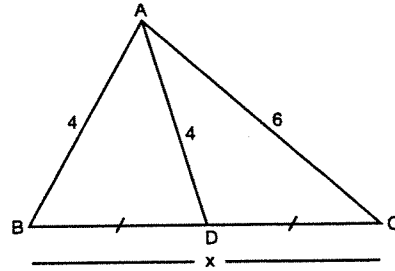
41.



$x = ?$

Cevap: $\sqrt{34}$

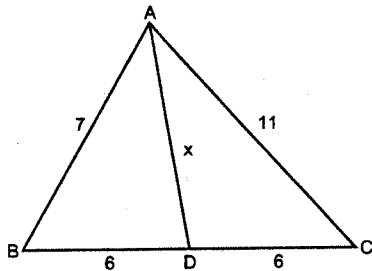
45.



$x = ?$

Cevap: $2\sqrt{10}$

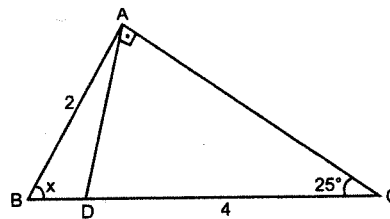
42.



$x = ?$

Cevap: 7

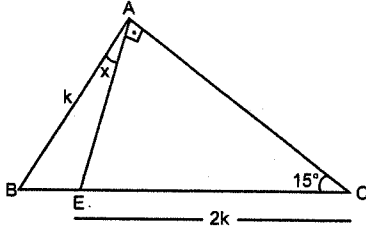
46.



$x = ?$

Cevap: 50°

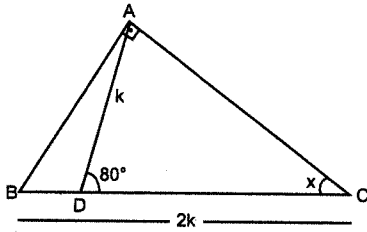
47.



$$x = ?$$

Cevap: 45

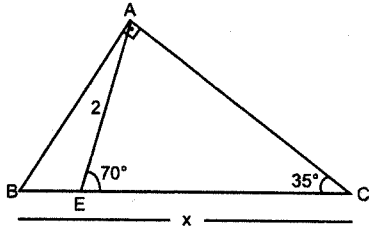
48.



$$x = ?$$

Cevap: 40

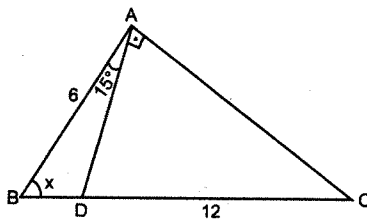
49.



$$x = ?$$

Cevap: 4

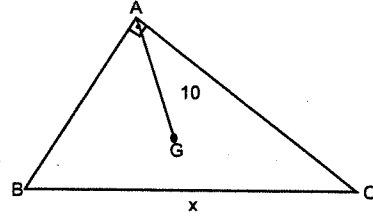
50.



$$x = ?$$

Cevap: 50°

51.

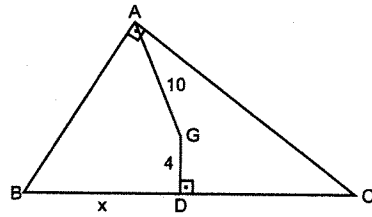


G, ağırlık merkezi

$$x = ?$$

Cevap: 30

52.

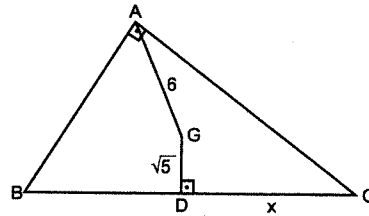


G, ağırlık merkezi

$$x = ?$$

Cevap: 12

53.

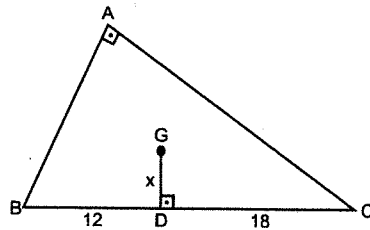


G, ağırlık merkezi

$$x = ?$$

Cevap: 11

54.

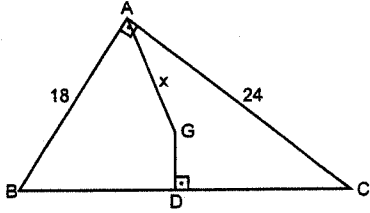


G, ağırlık merkezi

$$x = ?$$

Cevap: 4

55.

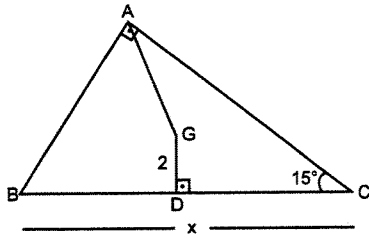


G, ağırlık merkezi

$x = ?$

Cevap: 10

56.

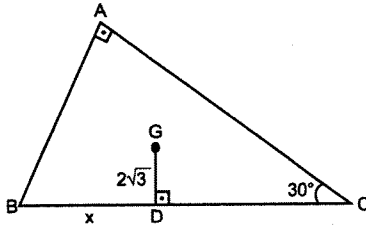


G, ağırlık merkezi

$x = ?$

Cevap: 24

57.

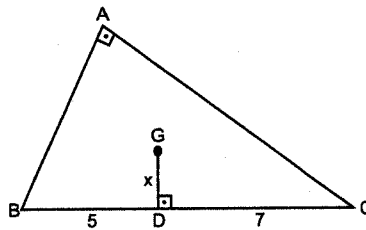


G, ağırlık merkezi

$x = ?$

Cevap: 10

58.

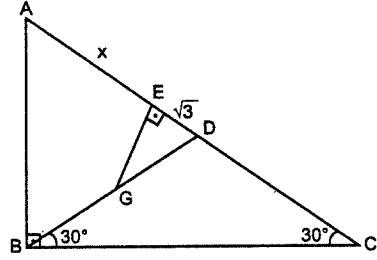


G, ağırlık merkezi

$x = ?$

Cevap: $\sqrt{3}$

59.

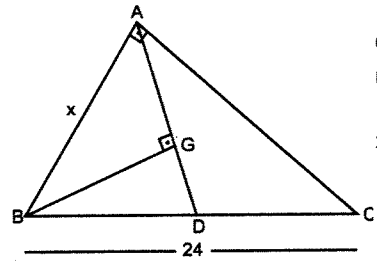


G, ağırlık merkezi

$x = ?$

Cevap: $5\sqrt{3}$

60.

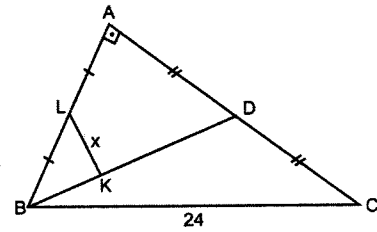


G, ağırlık merkezi

$x = ?$

Cevap: $8\sqrt{3}$

61.

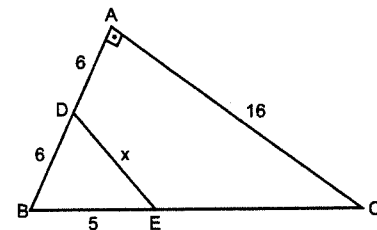


$2|BK| = |KD|$

$x = ?$

Cevap: 4

62.

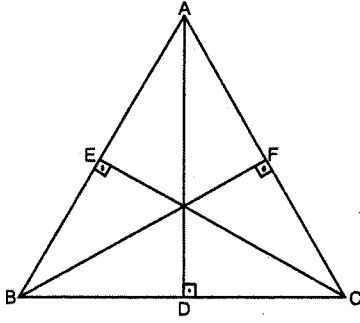


$x = ?$

Cevap: 5

ÜÇGENDE ALAN

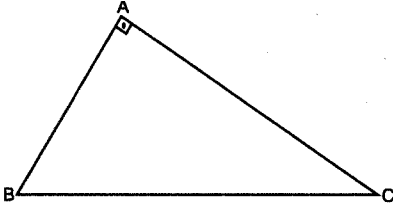
1.



$$\text{Alan}(\triangle ABC) = \frac{\text{Taban} \times \text{Yükseklik}}{2}$$

$$\text{Alan}(\triangle ABC) = \frac{|BC| \cdot |AD|}{2} = \frac{|AB| \cdot |EC|}{2} = \frac{|AC| \cdot |BF|}{2}$$

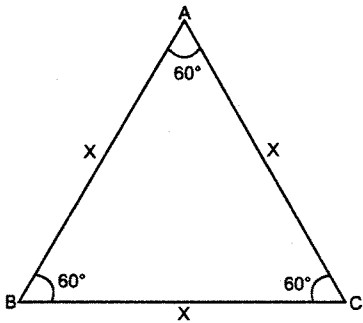
2.



$$\text{Alan}(\triangle ABC) = \text{Dik kenarların çarpımının yarısıdır.}$$

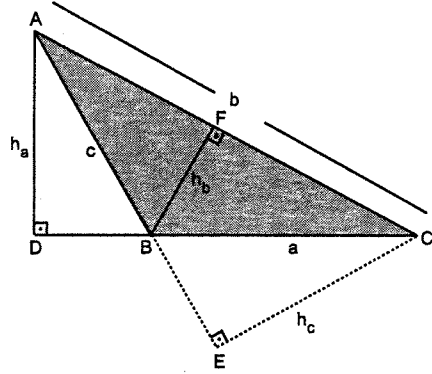
$$\text{Alan}(\triangle ABC) = \frac{|AB| \cdot |AC|}{2}$$

3.



$$\text{Eşkenar üçgenin alanı} = \frac{x^2 \sqrt{3}}{4}$$

4.

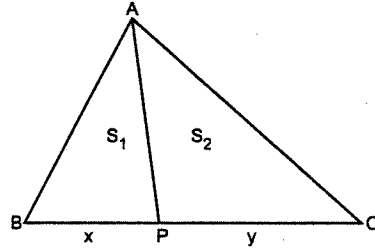


$$\text{Alan}(\triangle ABC) = T.A = \frac{a \cdot h_a}{2} = \frac{b \cdot h_b}{2} = \frac{c \cdot h_c}{2}$$

5.

İkizkenar üçgenin alanı sorulduğu zaman, tepeden tabana dik indirin ve gerekli işlemler yaptıktan sonra taban ve bu tabana ait yükseklik çarpımının yarısı kuralı ile alanı bulun.

6.

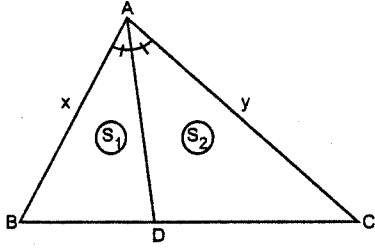


Yükseklikleri aynı olan iki üçgenin alanları oranı tabanları oranına eşittir.

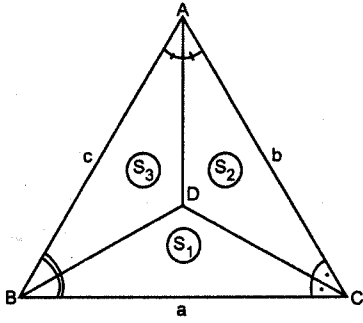
$$\frac{x}{y} = \frac{S_1}{S_2}$$

AÇIORTAYDA ALAN

7.

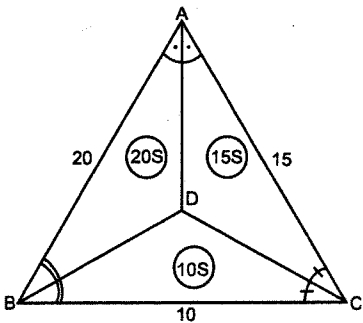


$$\frac{S_1}{S_2} = \frac{x}{y}$$



$$\frac{S_1}{a} = \frac{S_2}{b} = \frac{S_3}{c}$$

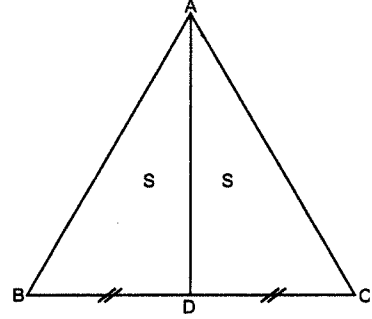
Örnek



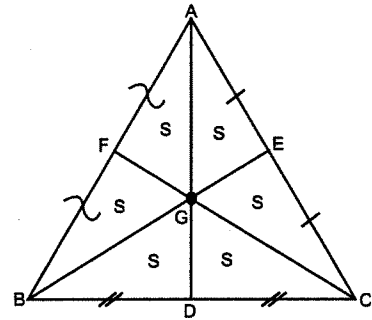
gibi.

KENARORTAYDA ALAN

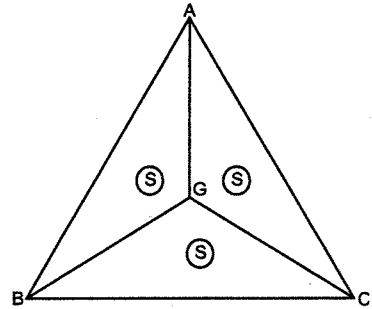
8. a)



b)

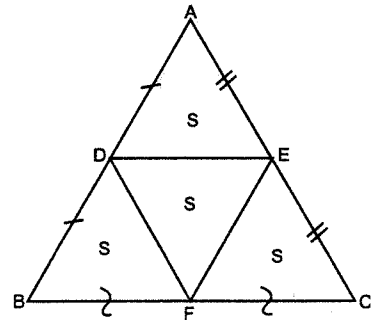


c)



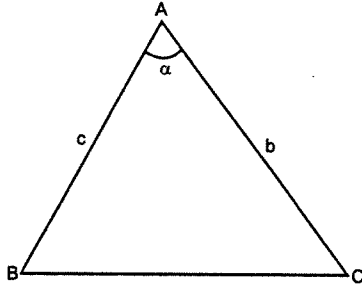
G: ağırlık merkezi

d)



Sinüs'lü Alan Formülü

9.



$$\text{Alan}(\triangle ABC) = \frac{b \cdot c}{2} \sin \alpha$$

$$\sin 30 = \frac{1}{2} = \sin 150$$

$$\sin 60 = \frac{\sqrt{3}}{2} = \sin 120$$

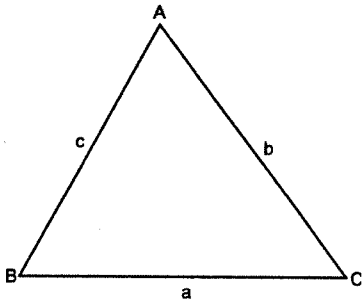
$$\sin 45 = \frac{\sqrt{2}}{2} = \sin 135$$

$$\sin 90 = 1$$

$$\sin \alpha = \sin(180 - \alpha)$$

Alan sorularında iki kenar ve bu iki kenar arasındaki açının sinüs'ü belli ise mutlaka bu formülü uygulayın.

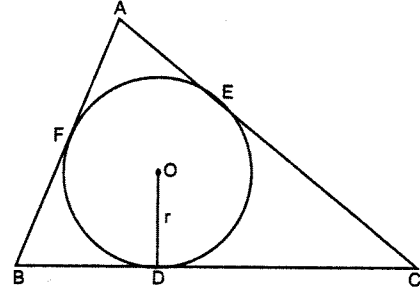
10.



$$\text{Ç}(\triangle ABC) = 2u = a + b + c$$

$$\text{Alan}(\triangle ABC) = \sqrt{u \cdot (u-a) \cdot (u-b) \cdot (u-c)}$$

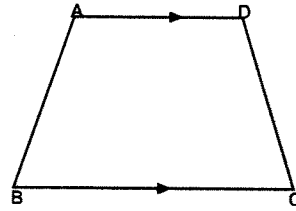
11.



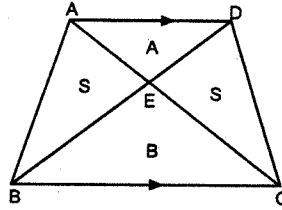
$$\text{Alan}(\triangle ABC) = u \cdot r$$

$$u = \frac{\text{Ç}(\triangle ABC)}{2}$$

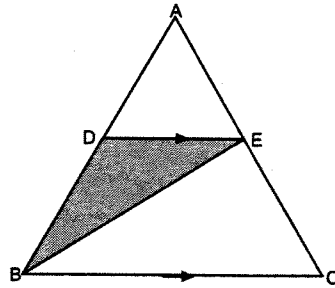
12 ALAN KAYDIRMA



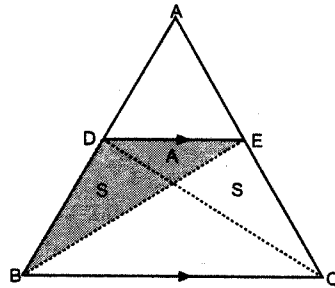
Yamuk



$$S^2 = A \cdot B$$



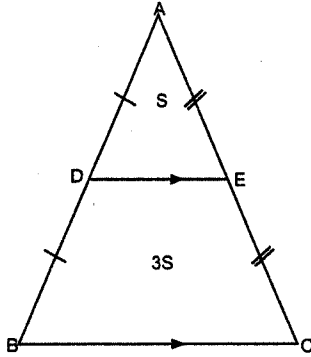
T.A sorulduğunda



$$\text{Alan}(\triangle BDE) = \text{Alan}(\triangle DEC)$$

Alanı kaydırmış olduk.

13. İki üçgen benzer ise benzerlik oranını karesi Alanları oranına eşittir.

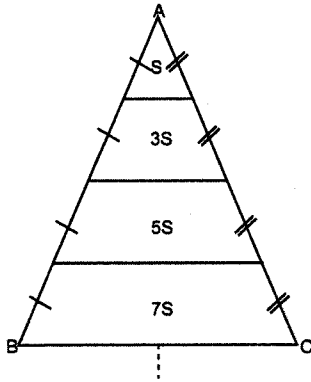


$$k: \text{benzerlik oranı} = \frac{1}{2}$$

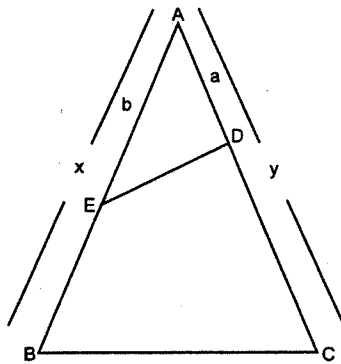
$$k^2 = \text{Alanları oranı} = \frac{1}{4}$$

$$A(\triangle ADE) = S$$

$$A(\triangle ABC) = 4S$$

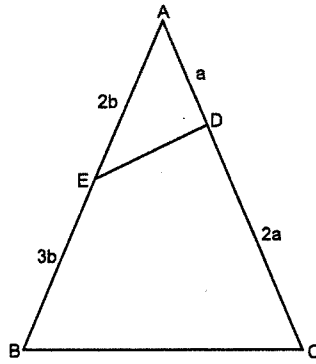


14.

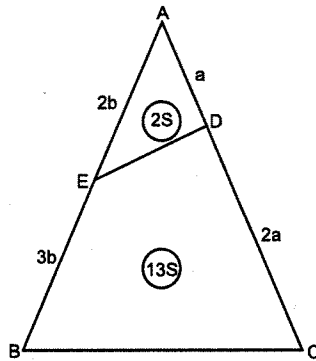


$$\frac{A(\triangle AED)}{A(\triangle ABC)} = \frac{a.b}{x.y}$$

Örnek



Çözüm

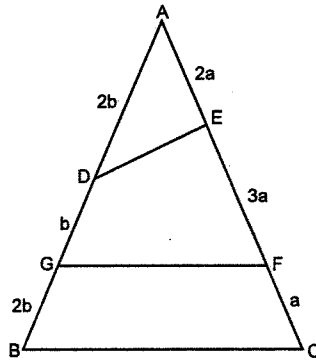


$$A(\triangle AED) = 2ab = 2S$$

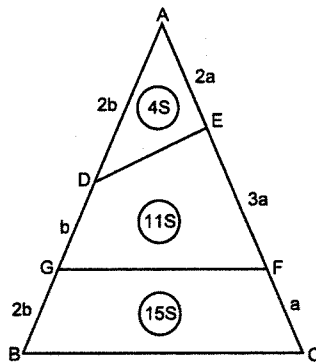
$$A(\triangle ABC) = 3a \cdot 5b.$$

$$= 15ab = 15S$$

Örnek



Çözüm

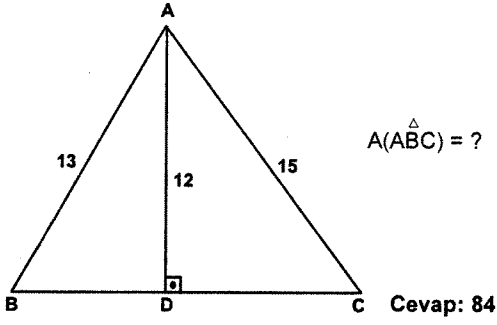


$$A(\triangle ADE) = 2a \cdot 2b = 4S$$

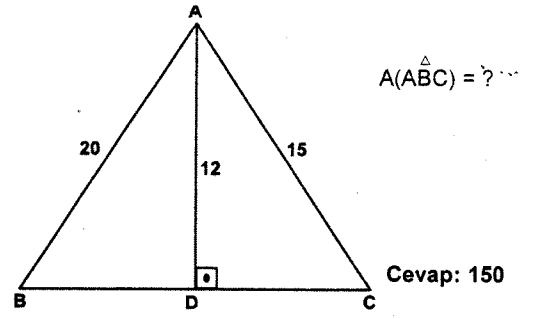
$$A(\triangle AGF) = 5a \cdot 3b = 15S$$

$$A(\triangle ABC) = 6a \cdot 5b = 30S$$

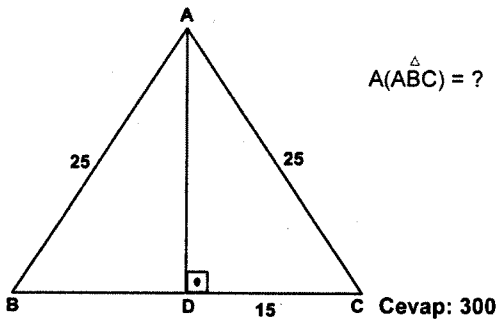
1.



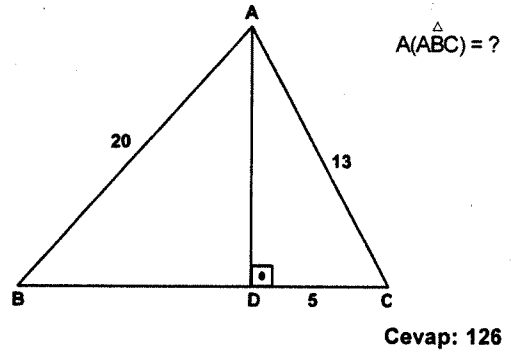
4.



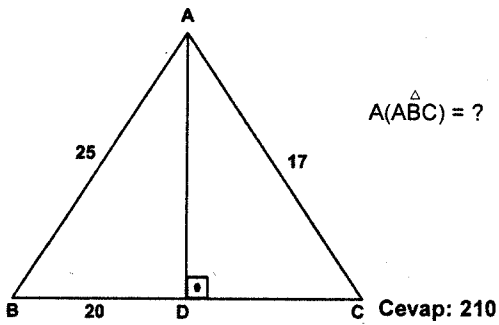
2.



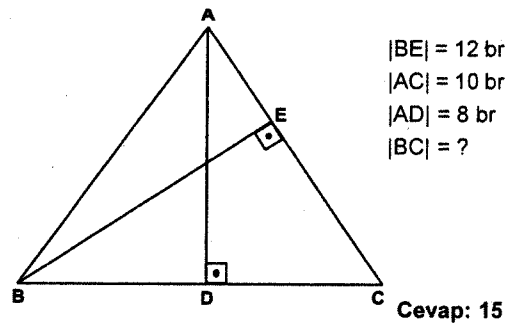
5.



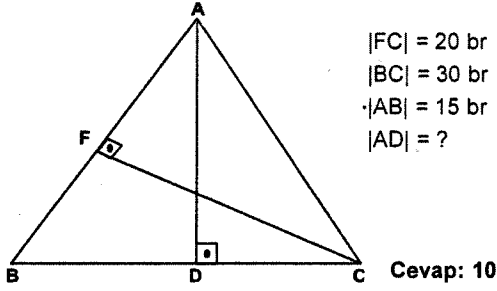
3.



6.

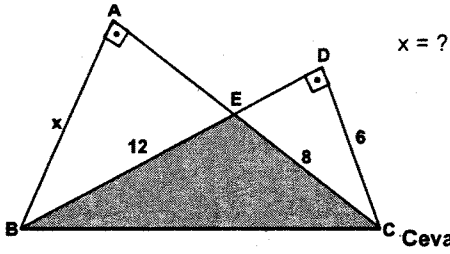


7.



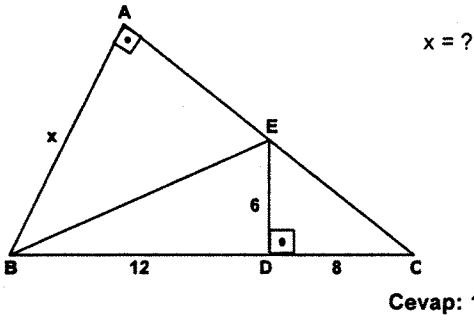
Cevap: 10

8.



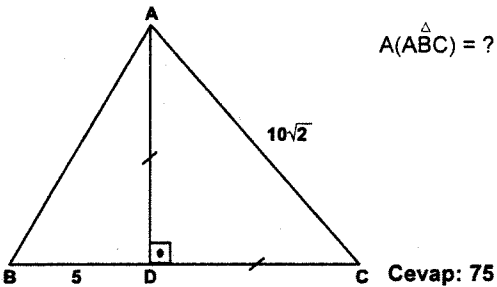
Cevap: 9

9.



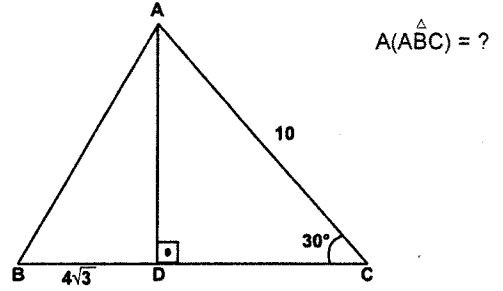
Cevap: 12

10.

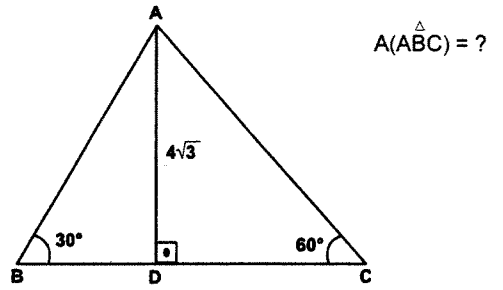


Cevap: 75

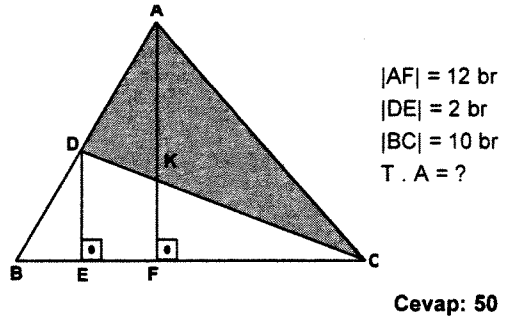
11.

Cevap: $\frac{45\sqrt{3}}{2}$

12.

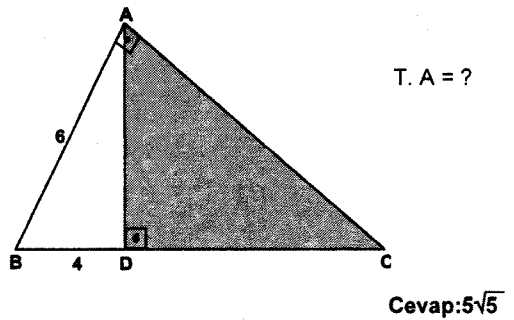
Cevap: $32\sqrt{3}$

13.

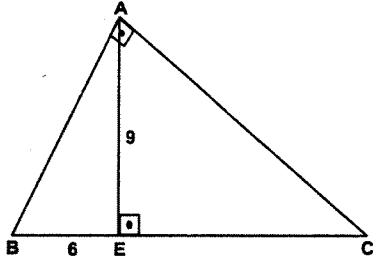


Cevap: 50

14.

Cevap: $5\sqrt{5}$

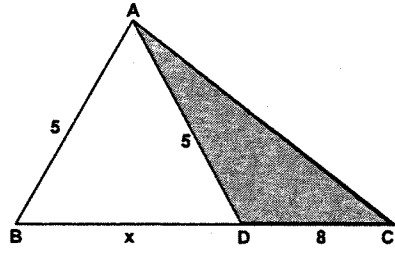
15.



$$A(\triangle ABC) = ?$$

$$\text{Cevap: } \frac{351}{4}$$

19.

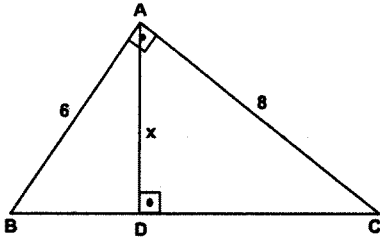


$$T : A = 12$$

$$x = ?$$

$$\text{Cevap: } 8$$

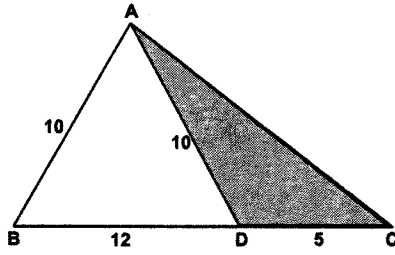
16.



$$x = ?$$

$$\text{Cevap: } 4,8$$

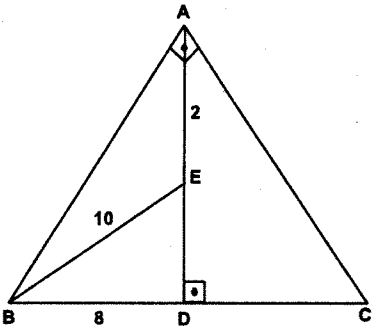
20.



$$T : A = ?$$

$$\text{Cevap: } 20$$

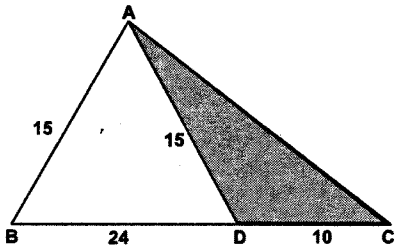
17.



$$A(\triangle ABC) = ?$$

$$\text{Cevap: } 64$$

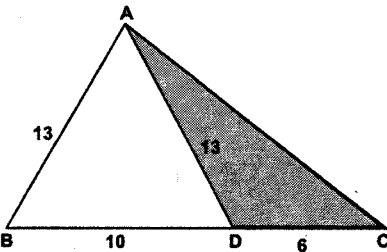
21.



$$T : A = ?$$

$$\text{Cevap: } 45$$

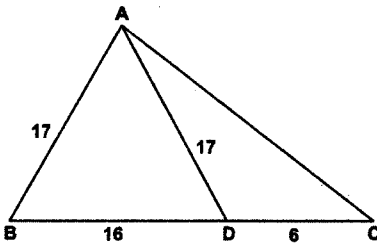
18.



$$T.A = ?$$

$$\text{Cevap: } 36$$

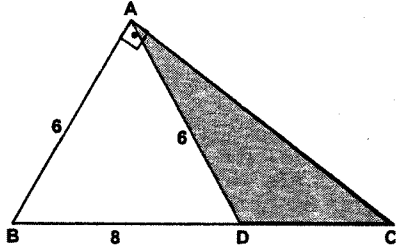
22.



$$A(\triangle ABC) = ?$$

$$\text{Cevap: } 165$$

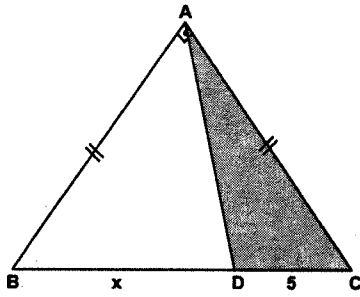
23.



T.A = ?

Cevap: $\sqrt{5}$

24.

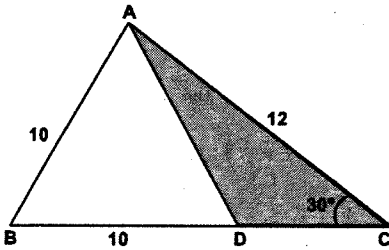


T.A = 30

 $x = ?$

Cevap: 19

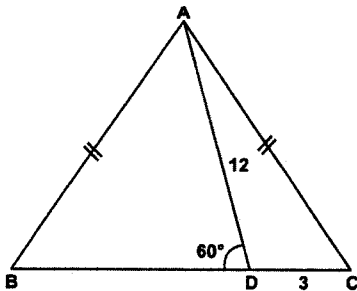
25.



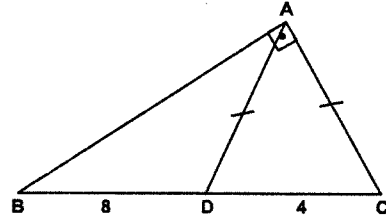
T.A = ?

Cevap: $18\sqrt{3} - 6$

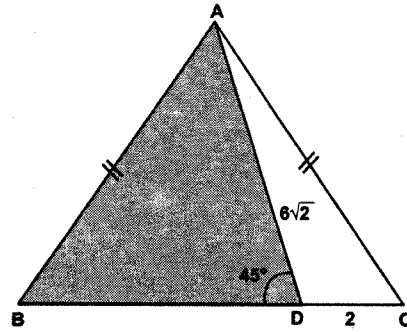
26.

 $A(\triangle ABC) = ?$ Cevap: $54\sqrt{3}$

27.

 $A(\triangle ABC) = ?$ Cevap: $12\sqrt{5}$

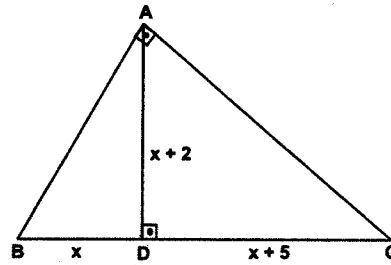
28.



T.A = ?

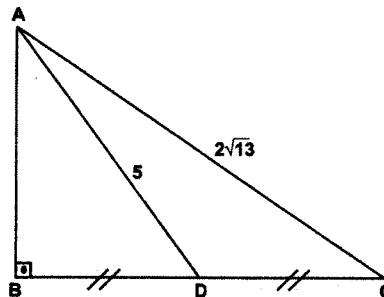
Cevap: 42

29.

 $A(\triangle ABC) = ?$

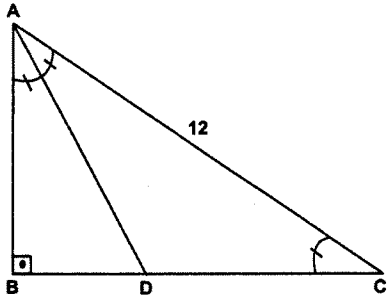
Cevap: 39

30.

 $A(\triangle ABC) = ?$

Cevap: 12

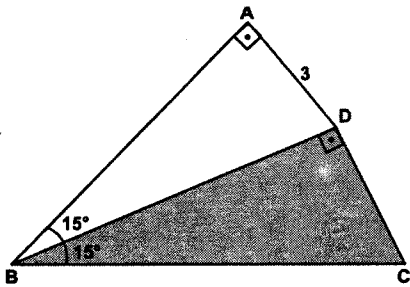
31.



$$A(\triangle ABC) = ?$$

Cevap: $18\sqrt{3}$

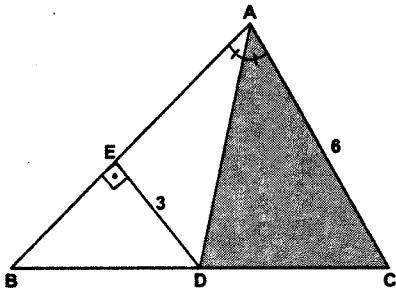
32.



$$T.A = ?$$

Cevap: 18

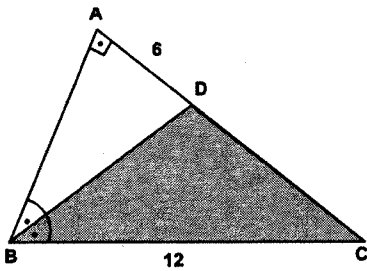
33.



$$T.A = ?$$

Cevap: 9

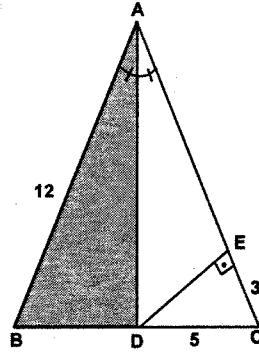
34.



$$T.A = ?$$

Cevap: 36

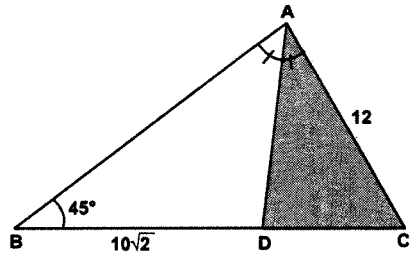
35.



$$T.A = ?$$

Cevap: 24

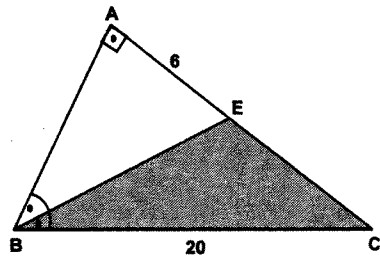
36.



$$T.A = ?$$

Cevap: 60

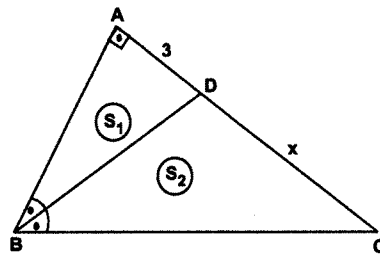
37.



$$T.A = ?$$

Cevap: 60

38.

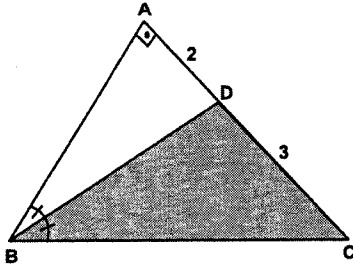


$$S_2 - S_1 = 6$$

$$x = ?$$

Cevap: 5

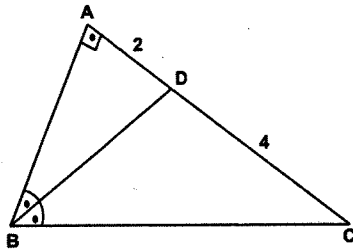
39.



T. A = ?

Cevap: $3\sqrt{5}$

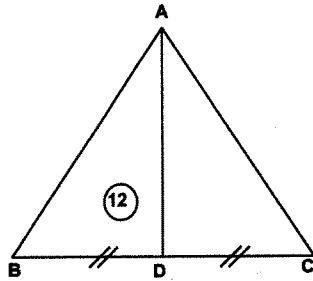
40.



$A(\triangle ABC) = ?$

Cevap: $6\sqrt{3}$

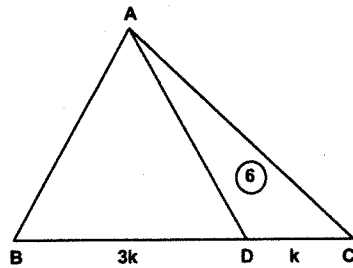
41.



$A(\triangle ABC) = ?$

Cevap: 24

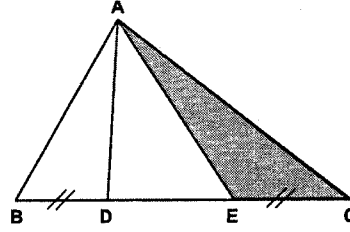
42.



$A(\triangle ABC) = ?$

Cevap: 24

43.



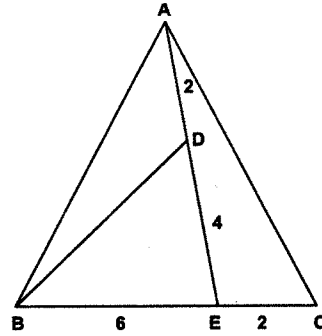
$2|DE| = |BC|$

$A(\triangle ABC) = 32$

T. A = ?

Cevap: 8

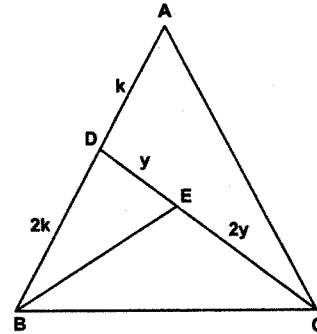
44.



$\frac{A(\triangle ABD)}{A(\triangle ABC)} = ?$

Cevap: $\frac{1}{4}$

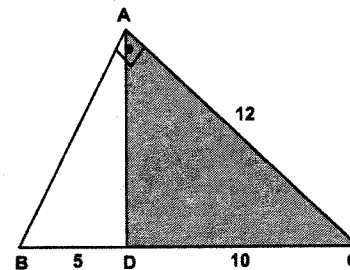
45.



$\frac{A(\triangle BEC)}{A(\triangle ABC)} = ?$

Cevap: $\frac{4}{9}$

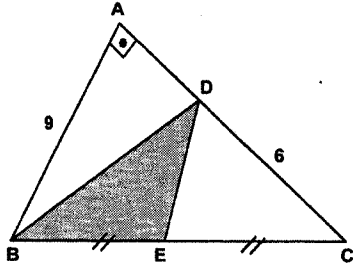
46.



T. A = ?

Cevap: 36

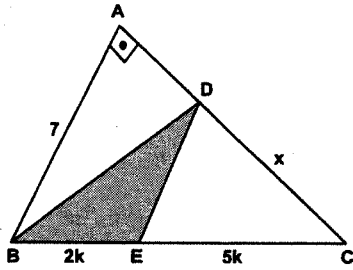
47.



T. A = ?

Cevap: $\frac{27}{2}$

48.

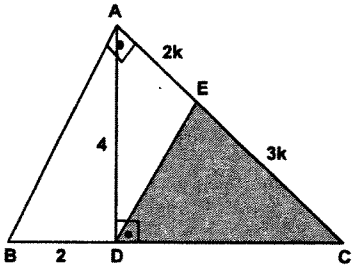


T. A = 4

x = ?

Cevap: 4

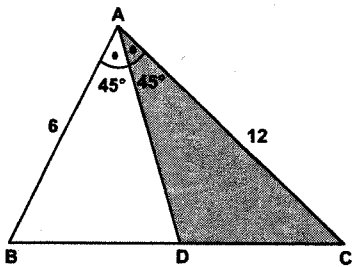
49.



T. A = ?

Cevap: $\frac{48}{5}$

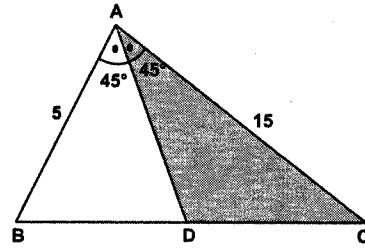
50.



T. A = ?

Cevap: 24

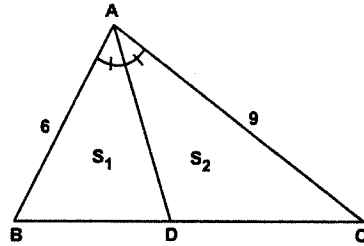
51.



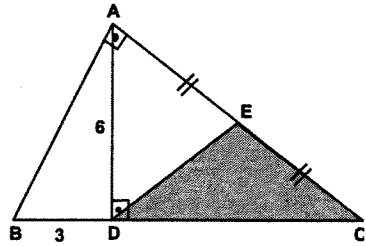
T. A = ?

Cevap: $\frac{225}{8}$

52.

 $\frac{S_1}{S_2} = ?$ Cevap: $\frac{2}{3}$

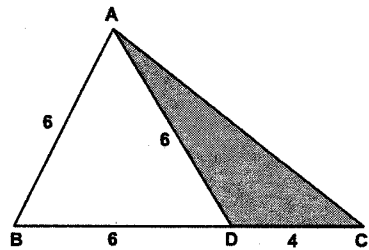
53.



T. A = ?

Cevap: 18

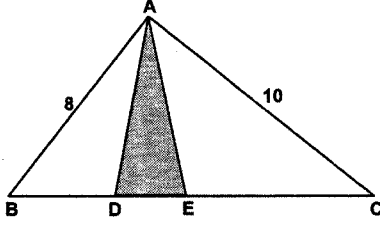
54.



T. A = ?

Cevap: $6\sqrt{3}$

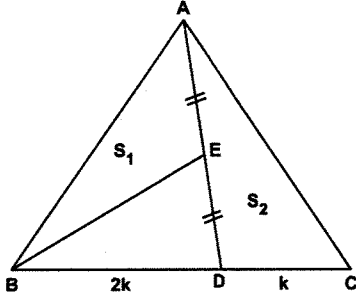
55.



[AD]
açıortay
[AE]
kenarortay
T . A = 2
 $A(\triangle ABC) = ?$

Cevap: 36

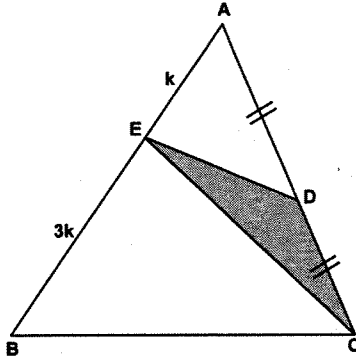
56.



$$\frac{S_1}{S_2} = ?$$

Cevap: 1

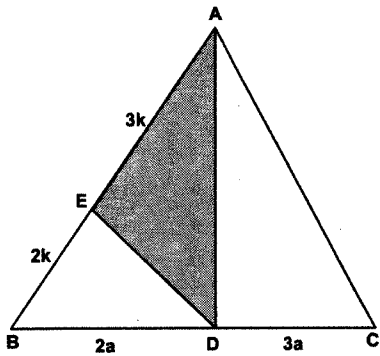
57



T . A = 6
 $A(\triangle ABC) = ?$

Cevap: 48

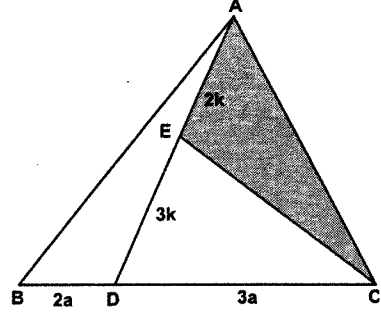
58



$$\frac{T . A}{A(\triangle ABC)} = ?$$

Cevap: $\frac{6}{25}$

59.

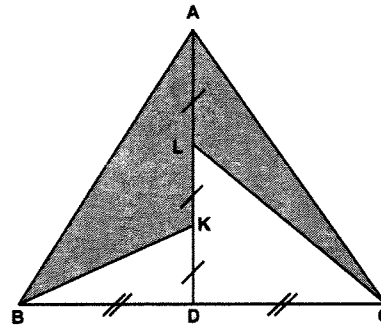


T . A = 6

 $A(\triangle ABC) = ?$

Cevap: 25

60.

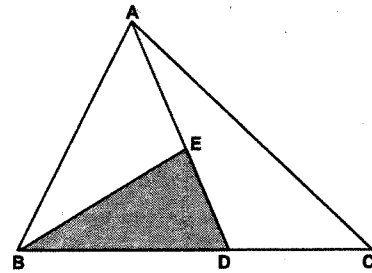


T . A = 12

 $A(\triangle ABC) = ?$

Cevap: 24

61.



$$2|AE| = 3|ED|$$

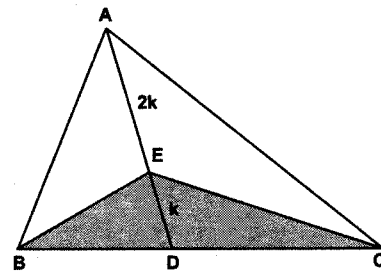
$$|BD| = 2|DC|$$

$$A(\triangle ABC) = 30$$

T . A = ?

Cevap: 8

62.

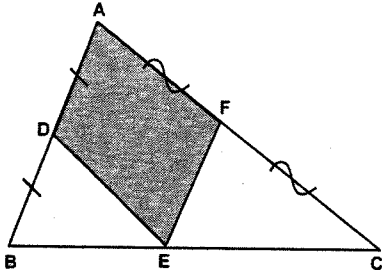


T . A = 12

 $A(\triangle ABC) = ?$

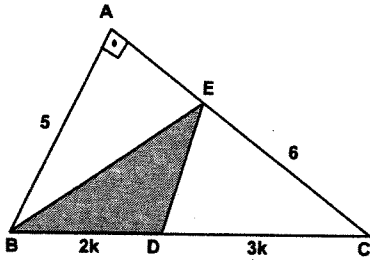
Cevap: 36

63.

 $T.A = 28$ $A(\triangle ABC) = ?$

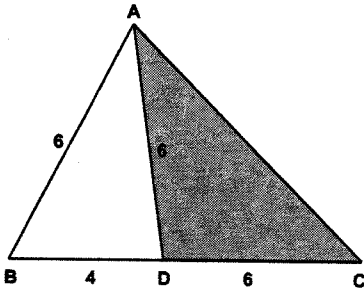
Cevap: 56

64.

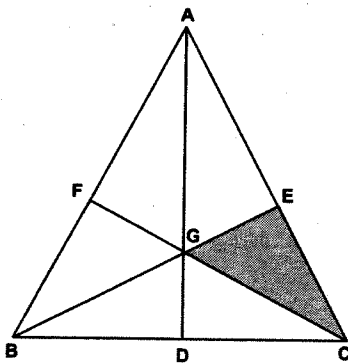
 $T.A = ?$

Cevap: 6

65.

 $T.A = ?$ Cevap: $12\sqrt{2}$

66.

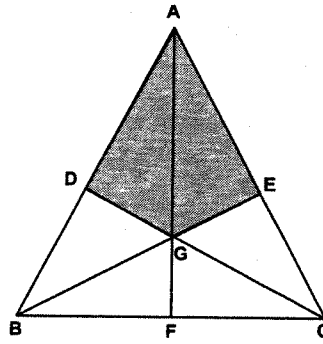


G, ağırlık merkezi

 $T.A = 10$ $A(\triangle ABC) = ?$

Cevap: 60

67.

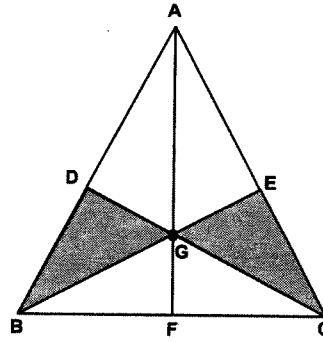


G, ağırlık merkezi

 $T.A = 13$ $A(\triangle ABC) = ?$

Cevap: 39

68.

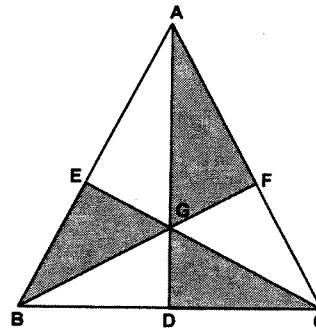


G, ağırlık merkezi

 $A(\triangle ABC) = 42$ $T.A = ?$

Cevap: 14

69.

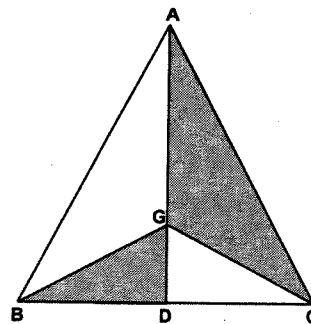


G, ağırlık merkezi

 $A(\triangle ABC) = 42$ $T.A = ?$

Cevap: 21

70.

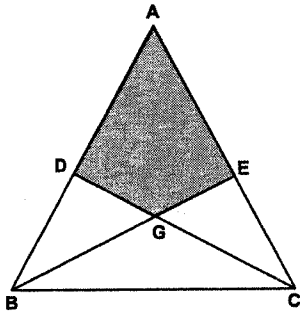


G, ağırlık merkezi

 $T.A = 12$ $A(\triangle ABC) = ?$

Cevap: 24

71.



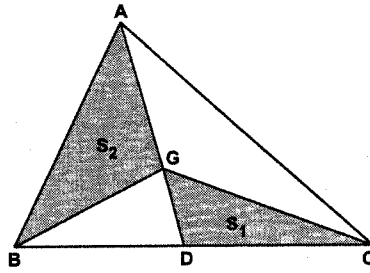
G, ağırlık merkezi

$$A(\triangle BGC) = 20$$

$$T.A = ?$$

Cevap: 20

75.

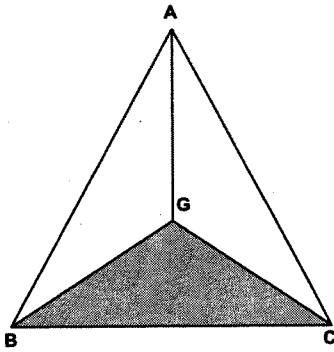


G, ağırlık merkezi

$$\frac{S_1}{S_2} = ?$$

Cevap: $\frac{1}{2}$

72.



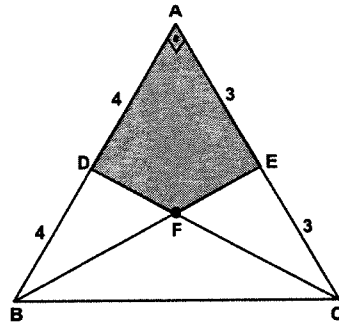
G, ağırlık merkezi

$$T.A = 18$$

$$A(\triangle ABC) = ?$$

Cevap: 54

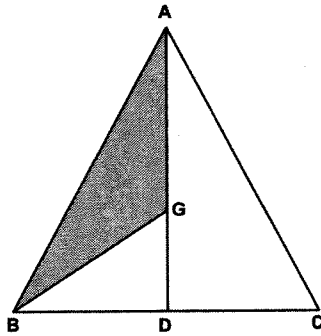
76.



$$T.A = ?$$

Cevap: 8

73.



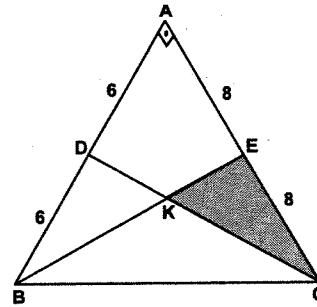
G, ağırlık merkezi

$$A(\triangle ADC) = 12$$

$$T.A = ?$$

Cevap: 8

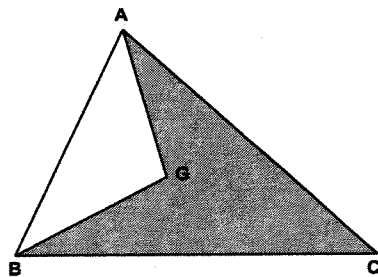
77.



$$T.A = ?$$

Cevap: 16

74.



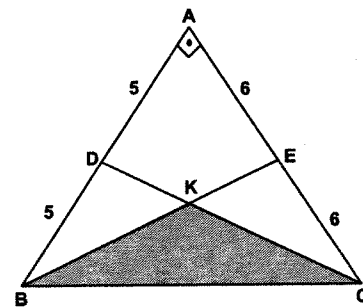
G, ağırlık merkezi

$$T.A = 32$$

$$A(\triangle ABC) = ?$$

Cevap: 48

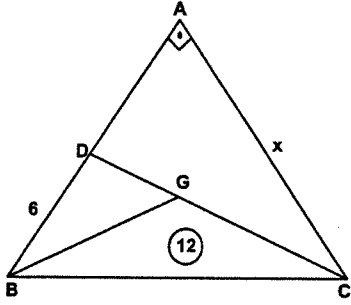
78.



$$T.A = ?$$

Cevap: 20

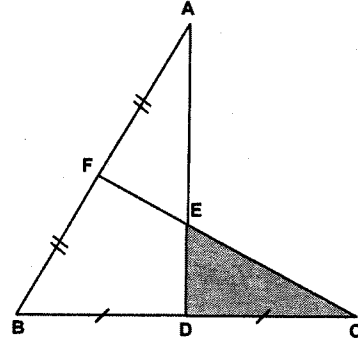
79.

G ağırlık
merkezi

$x = ?$

Cevap: 6

83.

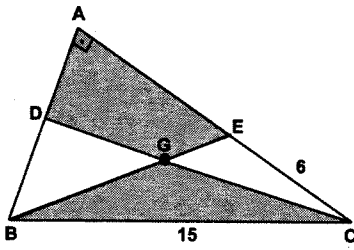


$T. A = 5$

$A(\triangle ABD) = ?$

Cevap: 15

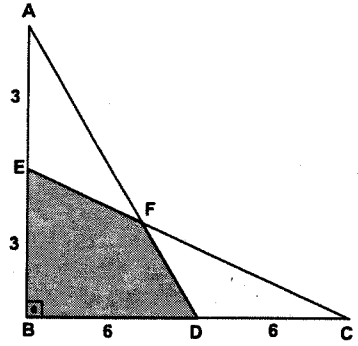
80.

G ağırlık
merkezi

$T. A = ?$

Cevap: 36

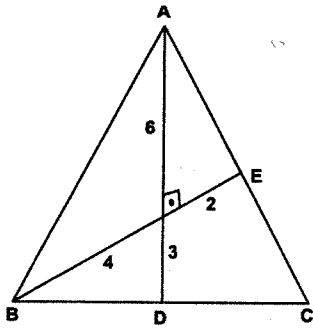
84.



$T. A = ?$

Cevap: 12

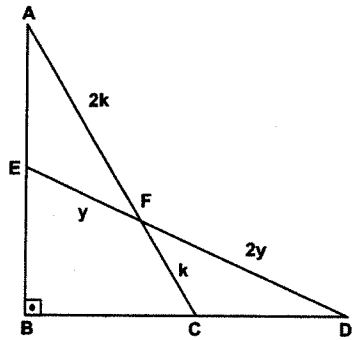
81.



$A(\triangle ABC) = ?$

Cevap: 36

85.

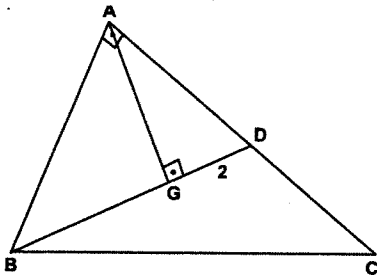


$A(\triangle ABC) = 24$

Tüm şeklin
alanı?

Cevap: 32

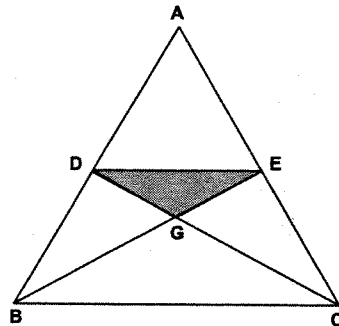
82.

G, ağırlık
merkezi

$A(\triangle ABC) = ?$

Cevap: $12\sqrt{2}$

86.

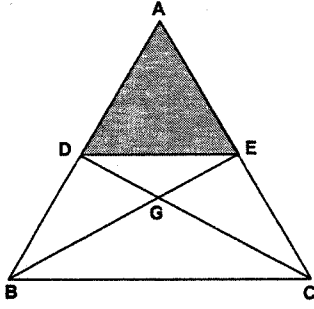
G ağırlık
merkezi

$T. A = 6$

$A(\triangle ABC) = ?$

Cevap: 72

87.



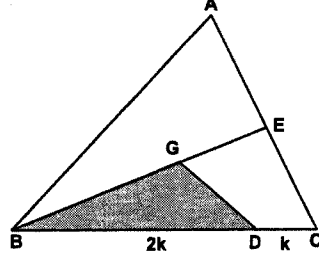
G, ağırlık merkezi

$$T.A = 6$$

$$A(\triangle DGE) = ?$$

Cevap: 2

91.



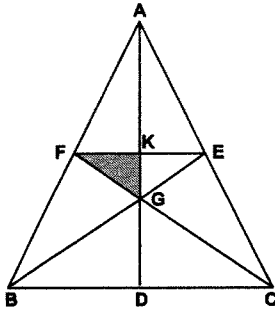
G, ağırlık merkezi

$$T.A = 20$$

$$A(\triangle ABC) = ?$$

Cevap: 90

88.



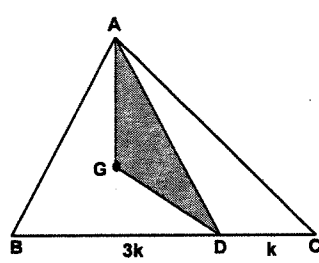
G, ağırlık merkezi

$$T.A = 3$$

$$A(\triangle ABC) = ?$$

Cevap: 72

92.

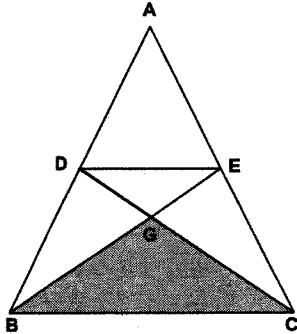
G, ABD'nin
ağırlık merkezi

$$T.A = 10$$

$$A(\triangle ABC) = ?$$

Cevap: 40

89.



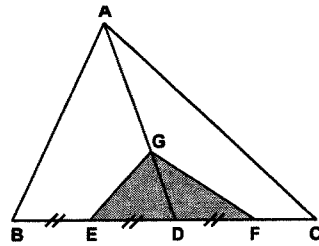
G, ağırlık merkezi

$$T.A = 20$$

$$Alan(\triangle DGE) = ?$$

Cevap: 5

93.



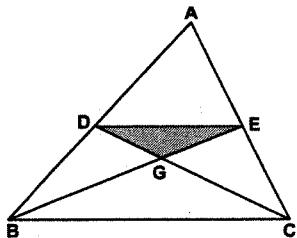
G, ağırlık merkezi

$$T.A = 6$$

$$A(\triangle ABC) = ?$$

Cevap: 36

90.



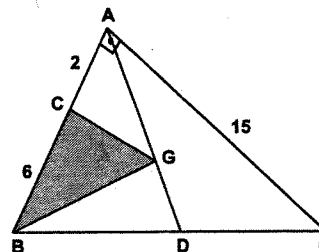
G, ağırlık merkezi

$$T.A = 6$$

$$Alan(\triangle BEC) = ?$$

Cevap: 36

94.

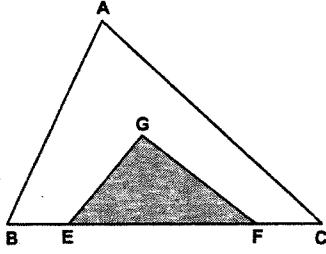


G, ağırlık merkezi

$$T.A = ?$$

Cevap: 15

95.



$$|BE| = |FC| = \frac{|EF|}{3}$$

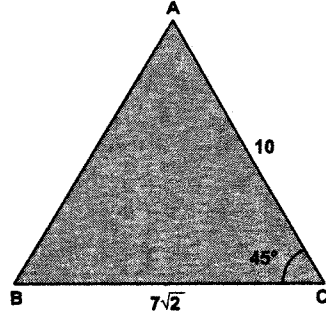
G, ağırlık merkezi

$$A(\triangle ABC) = 60$$

T. A = ?

Cevap: 12

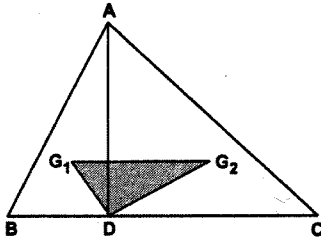
99.



T. A = ?

Cevap: 35

96.

 G_1 , ABD nin; G_2 , ADC nin

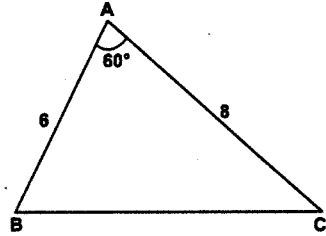
ağırlık merkezi

$$A(\triangle ABC) = 81$$

T. A = ?

Cevap: 9

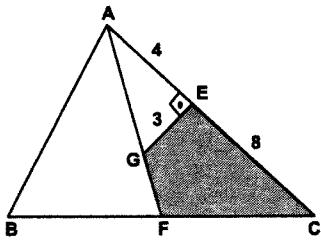
100.



$$A(\triangle ABC) = ?$$

Cevap: $12\sqrt{3}$

97.

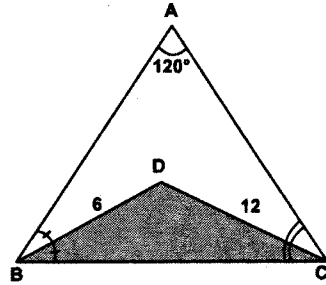


G, ağırlık merkezi

T. A = ?

Cevap: 21

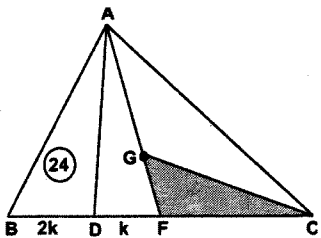
101.



T. A = ?

Cevap: 18

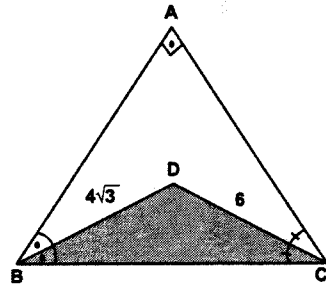
98.

G, ABC nin
ağırlık merkezi

T. A = ?

Cevap: 12

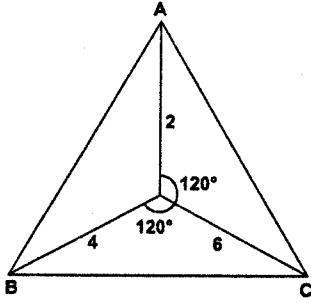
102.



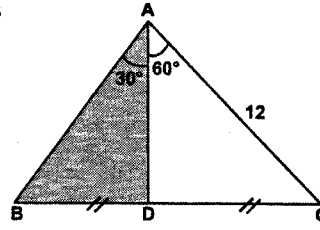
T. A = ?

Cevap: $6\sqrt{6}$

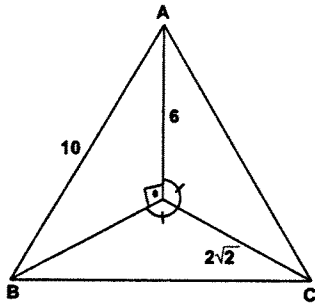
103.

 $A(\triangle ABC) = ?$ Cevap: $11\sqrt{3}$

107.

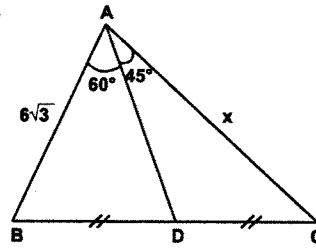
 $T.A = ?$ Cevap: $36\sqrt{3}$

104.

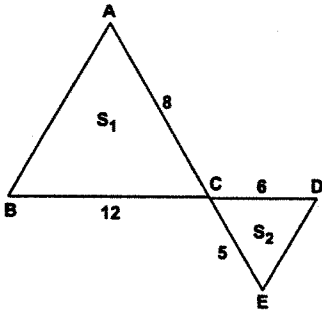
 $A(\triangle ABC) = ?$

Cevap: 38

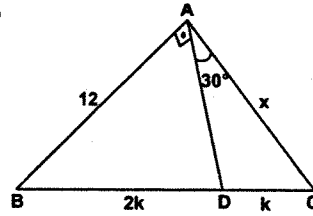
108.

 $x = ?$ Cevap: $9\sqrt{2}$

105.

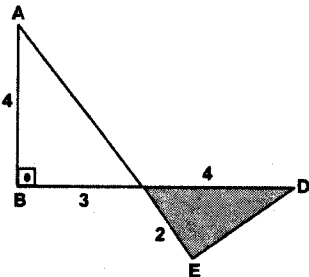
 $\frac{S_1}{S_2} = ?$ Cevap: $\frac{16}{5}$

109.

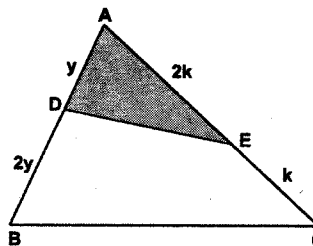
 $x = ?$

Cevap: 12

105.

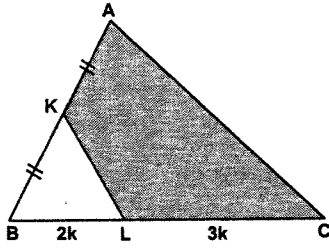
 $T.A = ?$ Cevap: $\frac{16}{5}$

110.

 $A(\triangle ABC) = 36$ $T.A = ?$

Cevap: 8

111.

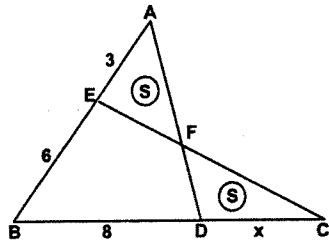


$$A(\triangle ABC) = 100$$

$$T. A = ?$$

Cevap: 80

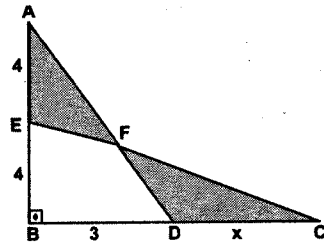
112.



$$x = ?$$

Cevap: 4

113.

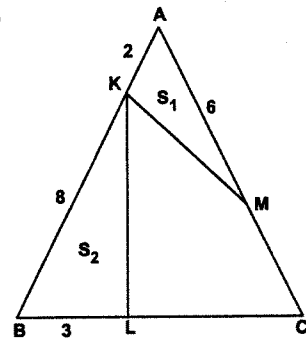


$$T. A'lar eşit$$

$$x = ?$$

Cevap: 3

114.

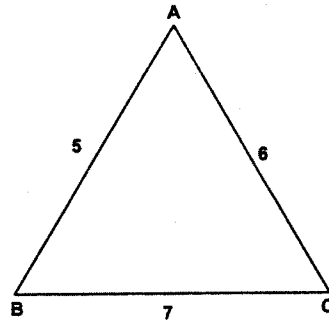


$$|AC| = |BC|$$

$$\frac{S_1}{S_2} = ?$$

Cevap: $\frac{1}{2}$

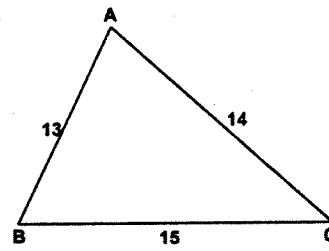
115.



$$A(\triangle ABC) = ?$$

Cevap: $6\sqrt{6}$

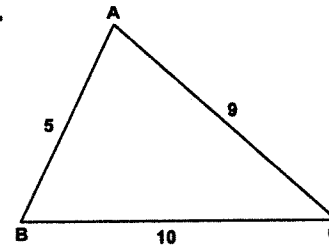
116.



$$A(\triangle ABC) = ?$$

Cevap: 84

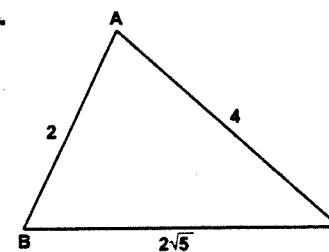
117.



$$A(\triangle ABC) = ?$$

Cevap: $6\sqrt{14}$

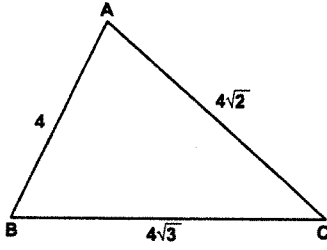
118.



$$A(\triangle ABC) = ?$$

Cevap: 4

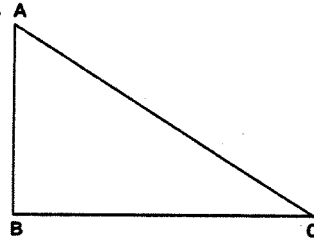
119.



$$A(\triangle ABC) = ?$$

$$\text{Cevap: } 8\sqrt{2}$$

123.



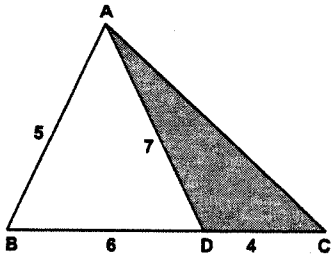
İç teğet çemberi-
nin yarıçapı 3 ve

$$\hat{Q}(\triangle ABC) = 20$$

$$A(\triangle ABC) = ?$$

$$\text{Cevap: } 30$$

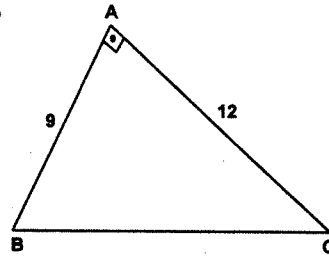
120.



$$T.A = ?$$

$$\text{Cevap: } 4\sqrt{6}$$

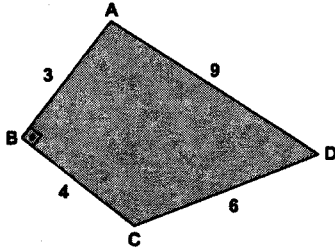
124.



İç teğet çemberi-
nin yarıçapı kaç-
tır?

$$\text{Cevap: } 3$$

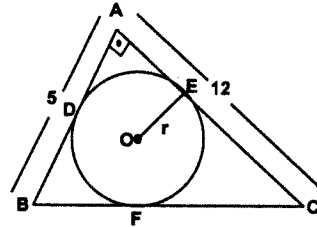
121.



$$T.A = ?$$

$$\text{Cevap: } 10\sqrt{2} + 6$$

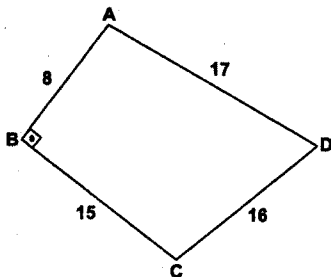
125.



İç teğet çemberi-
nin yarıçapı kaç-
tır?

$$\text{Cevap: } 2$$

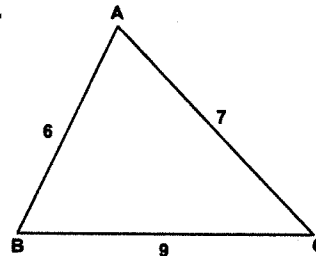
122.



$$A(ABCD) = ?$$

$$\text{Cevap: } 180$$

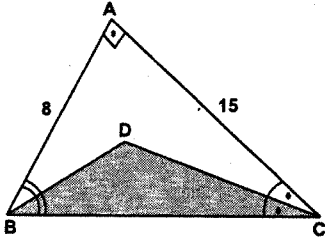
126.



İç teğet çemberi-
nin yarıçapı kaç-
tır?

$$\text{Cevap: } \frac{2\sqrt{110}}{11}$$

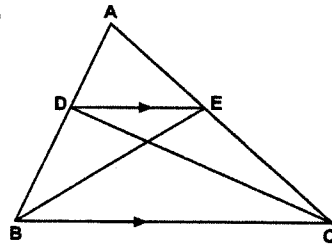
127.



$$\frac{T.A}{A(\triangle ABC)} = ?$$

Cevap: $\frac{17}{40}$

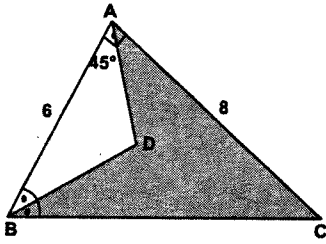
131.



$$\frac{A(\triangle BDE)}{A(\triangle DEC)} = ?$$

Cevap: 1

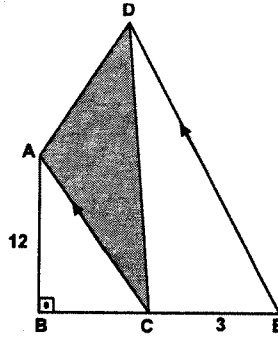
128.



$$T.A = ?$$

Cevap: 18

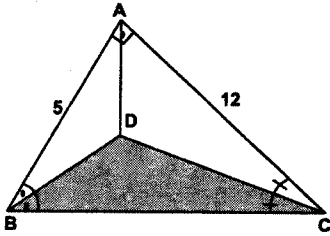
132.



$$T.A = ?$$

Cevap: 18

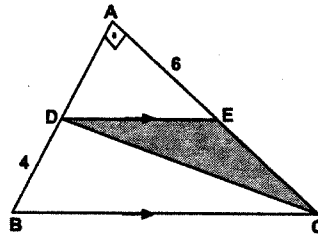
129.



$$T.A = ?$$

Cevap: 13

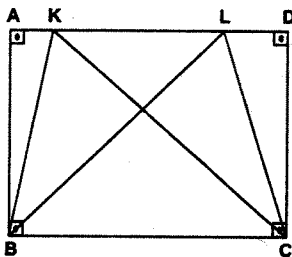
133.



$$T.A = ?$$

Cevap: 12

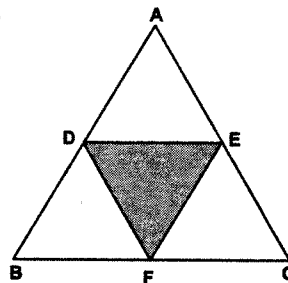
130.



$$\frac{A(\triangle BKC)}{A(\triangle BLC)} = ?$$

Cevap: 1

134.



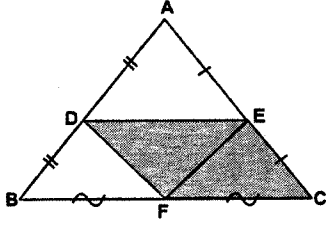
D ve E kenarlarının orta noktaları

$$T.A = 8$$

$$A(\triangle ABC) = ?$$

Cevap: 32

135.

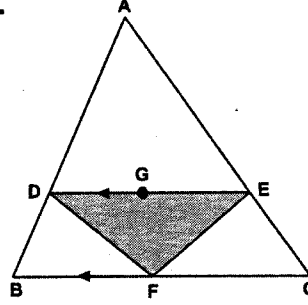


$$A(\triangle ABC) = 40$$

$$T.A = ?$$

Cevap: 20

139.



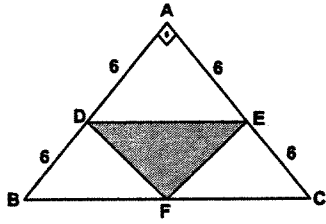
G, ağırlık merkezi

$$A(\triangle ABC) = 120$$

$$T.A = ?$$

Cevap: $\frac{80}{3}$

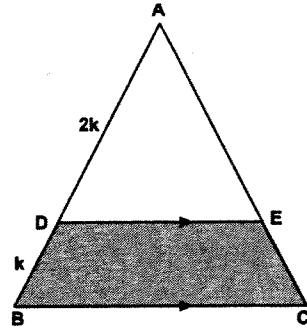
136.



$$T.A = ?$$

Cevap: 18

140.

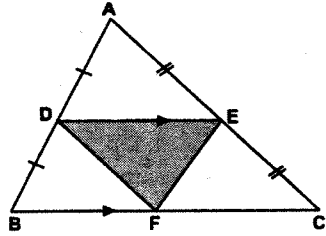


$$A(\triangle ABC) = 81$$

$$T.A = ?$$

Cevap: 45

137.

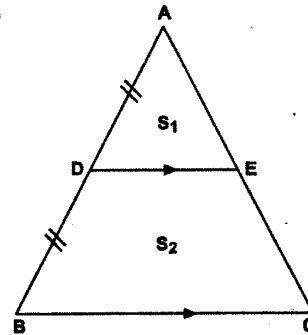


$$T.A = 10$$

$$A(\triangle ABC) = ?$$

Cevap: 40

141.

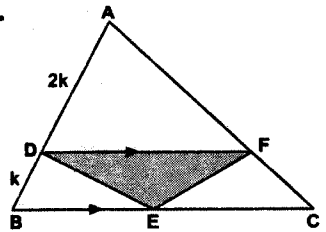


$$S_2 - S_1 = 16$$

$$A(\triangle ABC) = ?$$

Cevap: 32

138.

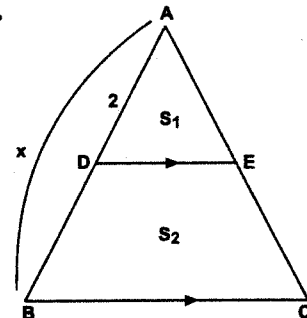


$$T.A = 20$$

$$A(\triangle ABC) = ?$$

Cevap: 90

142.

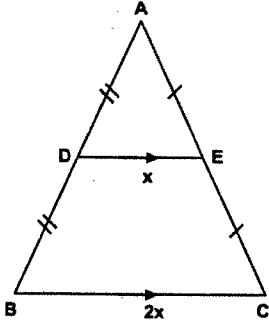


$$S_2 = S_1$$

$$x = ?$$

Cevap: $2\sqrt{2}$

ORTA TABAN



$$|AD| = |DB| \dots\dots\dots (1)$$

$$|AE| = |EC| \dots\dots\dots (2)$$

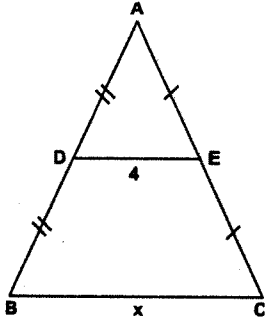
$$|DE| \parallel |BC| \dots\dots\dots (3)$$

$$2|DE| = |BC| = 2x \dots\dots\dots (4)$$

Orta tabanın oluşabilmesi için yandaki 4 özelliğten herhangi ikisi verilmelidir.

Ya da orta noktalardan paralel çizerek bu iki özelliği elde edebiliriz

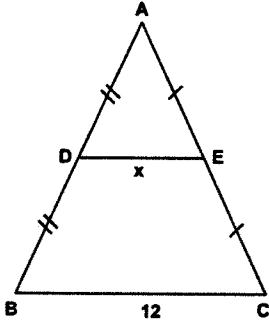
1.



$$x = ?$$

Cevap: 8

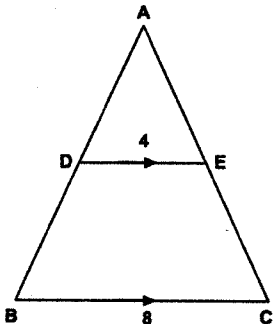
2.



$$x = ?$$

Cevap: 6

3.



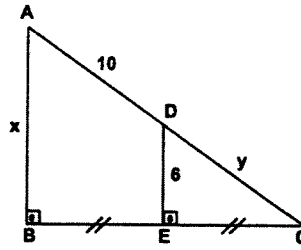
$$|AB| = 10 \text{ cm}$$

$$|AC| = 12 \text{ cm}$$

$$\text{Çevre}(\triangle ADE) = ?$$

Cevap: 15

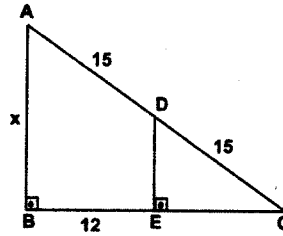
4.



$$x - y = ?$$

Cevap: 2

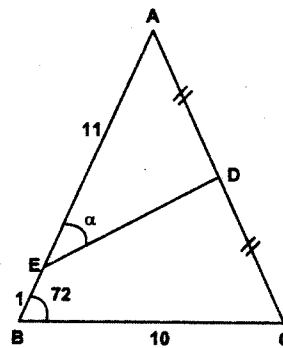
5.



$$x = ?$$

Cevap: 18

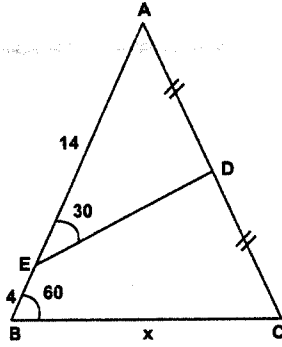
6.



$$\alpha = ?$$

Cevap: 36

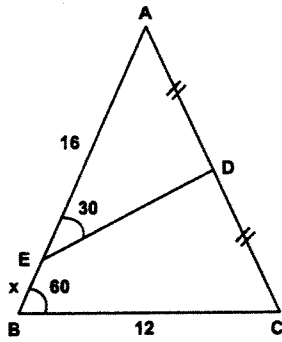
7.



$x = ?$

Cevap: 10

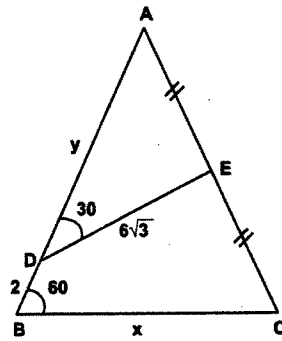
8.



$x = ?$

Cevap: 4

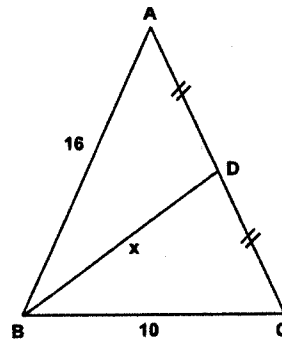
9.



$y + x = ?$

Cevap: 26

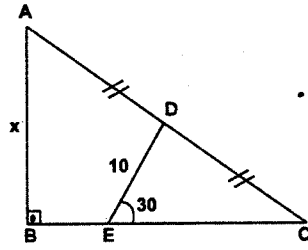
10.



x'in alabileceği kaç tam sayı değeri vardır?

Cevap: 9

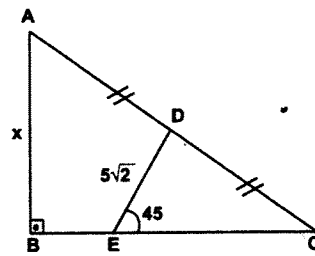
11.



$x = ?$

Cevap: 10

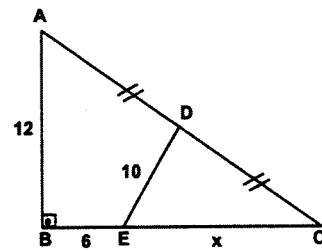
12.



$x = ?$

Cevap: 10

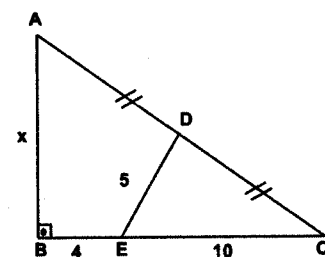
13.



$x = ?$

Cevap: 22

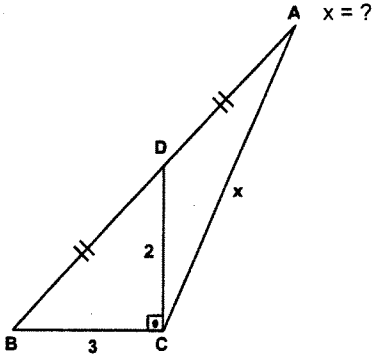
14.



$x = ?$

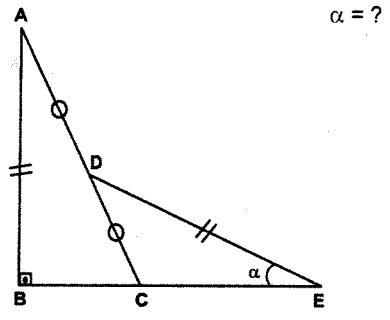
Cevap: 8

15.



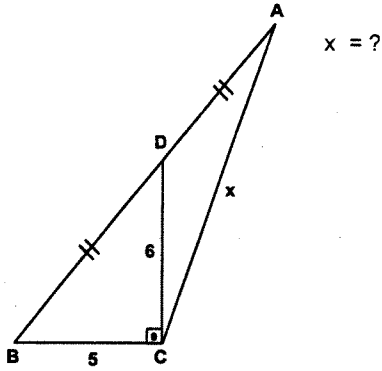
Cevap: 5

19.



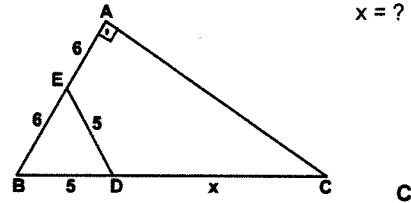
Cevap: 30

16.



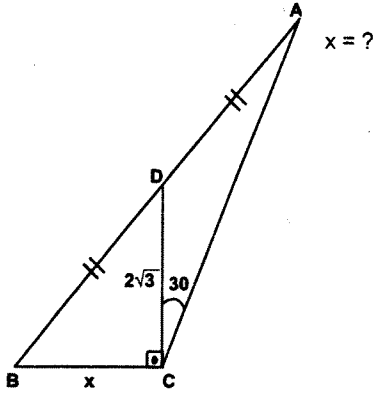
Cevap: 13

20.



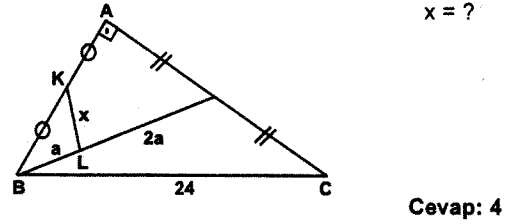
Cevap: 15

17.



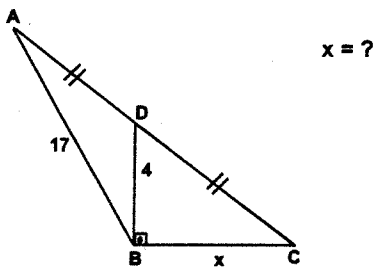
Cevap: 4

21.



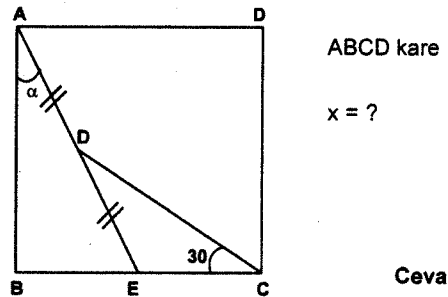
Cevap: 4

18.



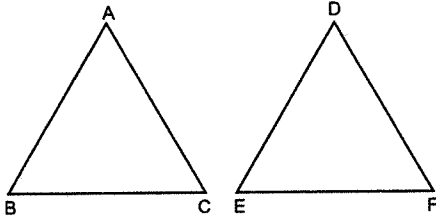
Cevap: 15

22.



Cevap: 15

BENZERLİK



İki üçgen benzer ise kenarları orantılı, orantılı kenarların karşısındaki açılar ise eşittir.

"~" Benzerlik sembolüdür.

$$\triangle ABC \sim \triangle DEF \Rightarrow \begin{aligned} m(\widehat{A}) &= m(\widehat{D}) \\ m(\widehat{B}) &= m(\widehat{E}) \\ m(\widehat{C}) &= m(\widehat{F}) \text{ ve} \end{aligned}$$

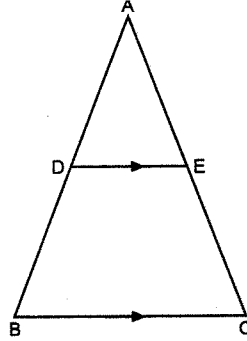
$$\frac{|AB|}{|DE|} = \frac{|BC|}{|EF|} = \frac{|AC|}{|DF|} = k$$

k: benzerlik oranıdır.

* İki üçgen benzer ise

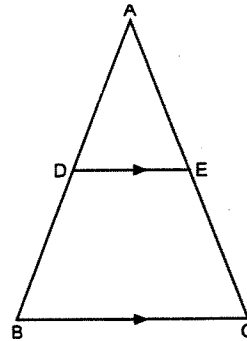
- Kenarları oranı
- yükseklikleri oranı
- açıortayları oranı
- kenarortayları oranı
- çevreleri oranı benzerlik oranı (k)'ya eşittir.
- Alanları oranı ise benzerlik oranının karesine eşittir.

Temel Benzerlik Şekli



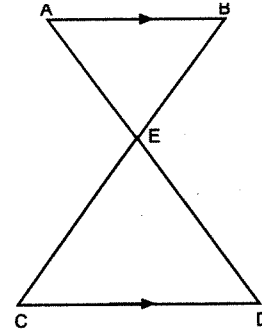
$$\triangle ADE \sim \triangle ABC$$

$$\frac{|AD|}{|AB|} = \frac{|DE|}{|BC|} = \frac{|AE|}{|AC|}$$



$$\frac{|AD|}{|DB|} = \frac{|AE|}{|EC|}$$

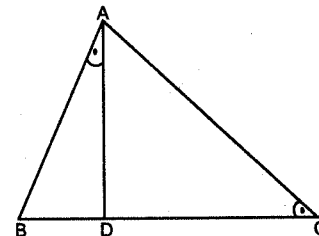
* Kelebek Benzerliği



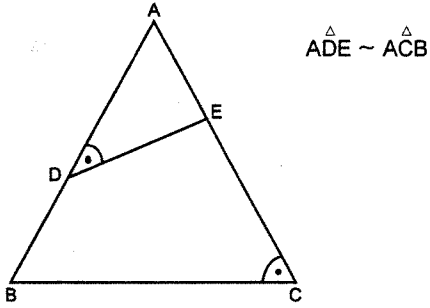
$$\triangle ABE \sim \triangle DCE$$

Bu benzerlik paralelkenar, kare, dikdörtgen ve yamukta çok sık kullanılır.

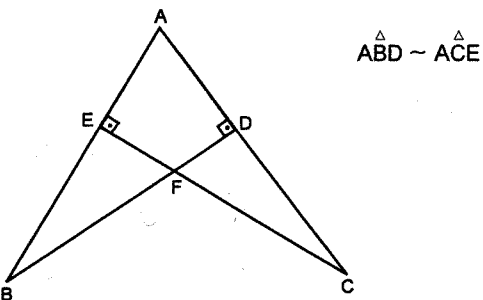
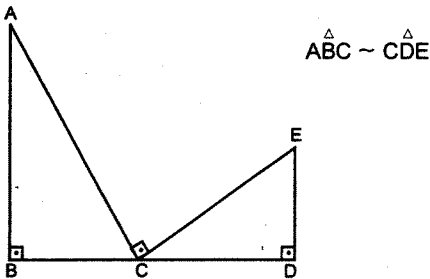
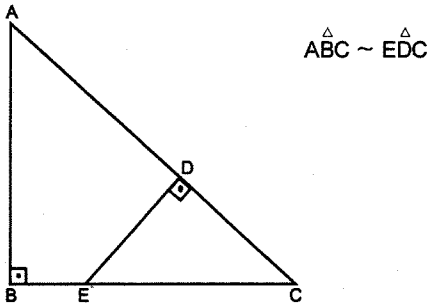
* Bir açısı ortak ve birer açısı aynı olan şekillerin benzerliği



$$\triangle ABC \sim \triangle DBA$$

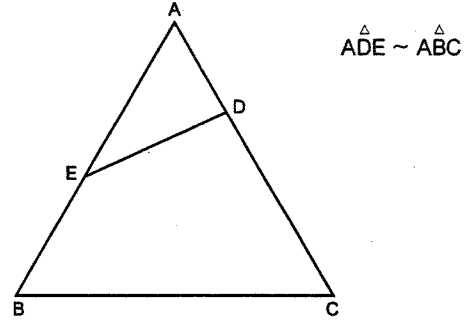


* Şekiller içinde birden fazla doksan dereceli var ise,



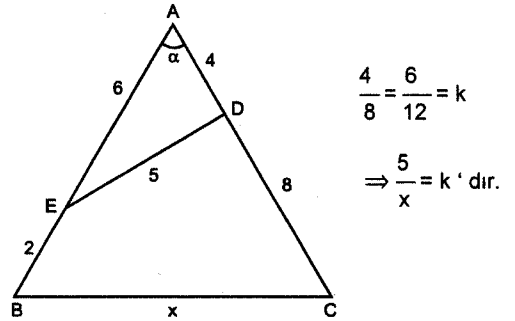
Kare, dikdörtgen gibi şekiller arasında bu benzerlik kullanılır.

* Kenar - Aç - Kenar Benzerliği



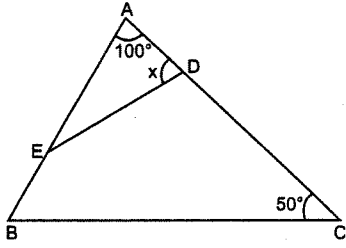
İki üçgen için ortak açının komşu kenarlarının oranı ne ise bu açının karşısındaki kenarların oranında aynıdır.

Örnek



Yani iki üçgen için 4 ile çaprazındaki kenar 8, 6 ile çaprazındaki kenar 12 birbirine bölünür. Eğer eşit çıkarsa ortak açının karşısındaki kenarda bu orana eşittir.

1.

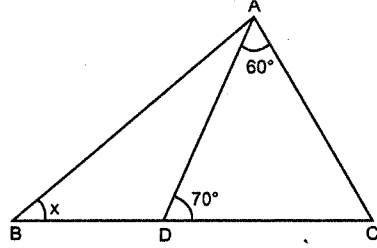


$$\triangle ABC \sim \triangle ADE$$

$$x = ?$$

Cevap: 30

4.

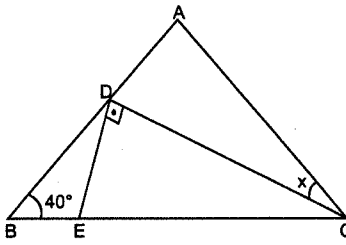


$$\triangle ABD \sim \triangle CBA$$

$$x = ?$$

Cevap: 20

2.

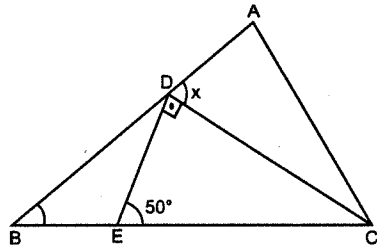


$$\triangle ABC \sim \triangle DCE$$

$$x = ?$$

Cevap: 10

5.

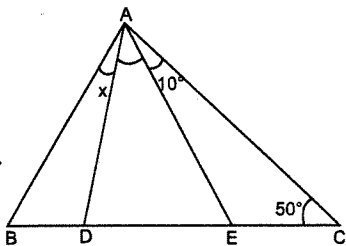


$$\triangle ABC \sim \triangle DCE$$

$$x = ?$$

Cevap: 80

3.

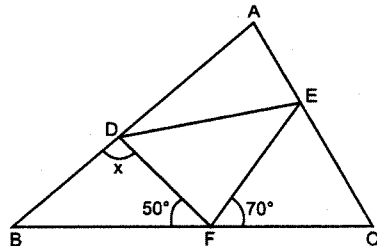


$$\triangle ABC \sim \triangle DEA$$

$$x = ?$$

Cevap: 10

6.

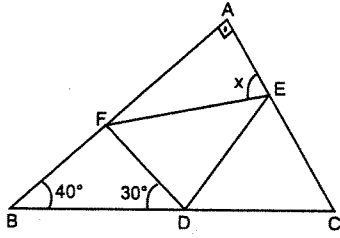


$$\triangle ABC \sim \triangle DFE$$

$$x = ?$$

Cevap: 70

7.

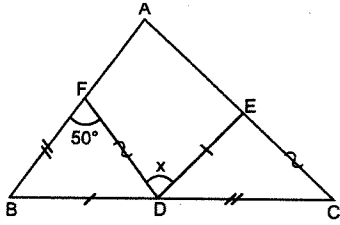


$$\triangle ABC \sim \triangle DEF$$

$$x = ?$$

Cevap: 70

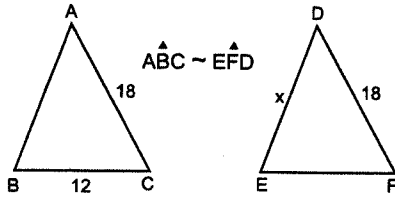
8.



$$x = ?$$

Cevap: 50

9.

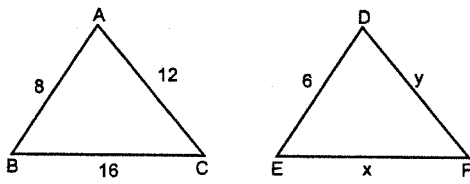


$$\triangle ABC \sim \triangle DEF$$

$$x = ?$$

Cevap: 27

10.

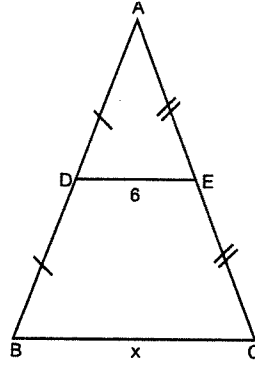


$$\triangle ABC \sim \triangle DEF$$

$$x + y = ?$$

Cevap: 21

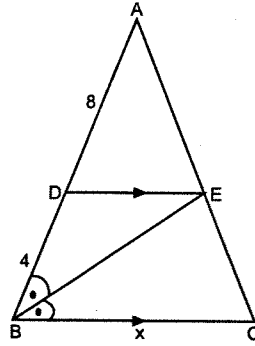
11.



$$x = ?$$

Cevap: 12

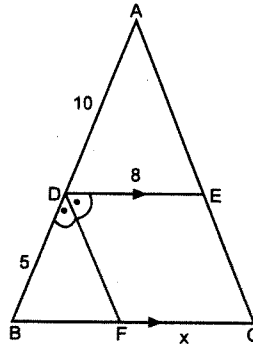
12.



$$x = ?$$

Cevap: 6

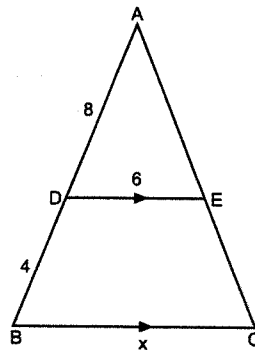
13.



$$x = ?$$

Cevap: 7

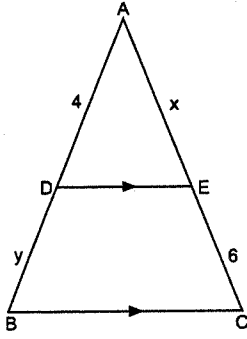
14.



$$x = ?$$

Cevap: 9

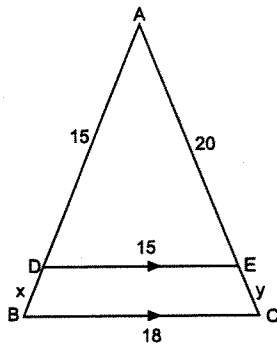
15.



$$x \cdot y = ?$$

Cevap: 24

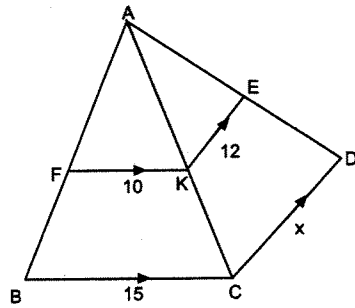
16.



$$x + y = ?$$

Cevap: 7

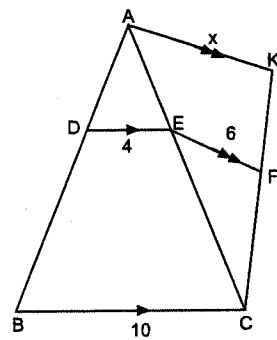
17.



$$x = ?$$

Cevap: 18

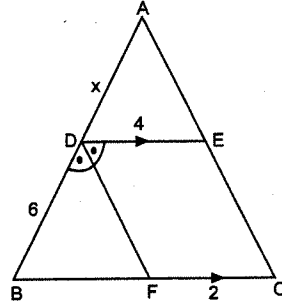
18.



$$x = ?$$

Cevap: 10

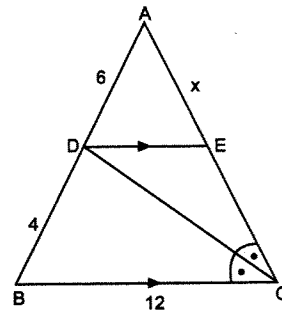
19.



$$x = ?$$

Cevap: 6

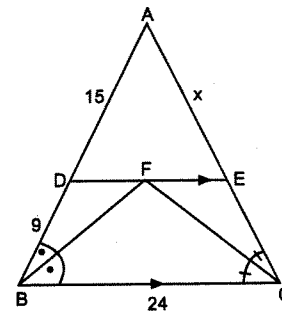
20.



$$x = ?$$

Cevap: 10,8

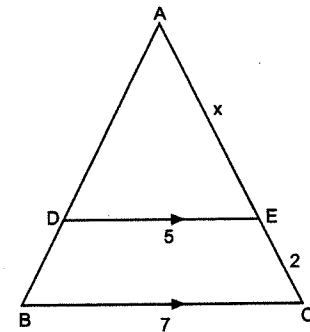
21.



$$x = ?$$

Cevap: 10

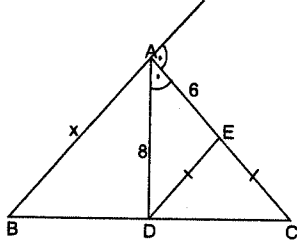
22.



$$x = ?$$

Cevap: 5

23.

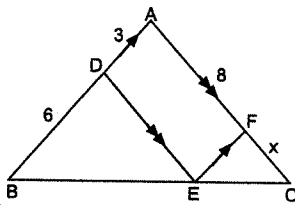


$x = ?$

$|DE| \parallel |AB|$

Cevap: 14

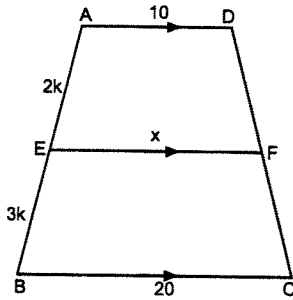
24.



$x = ?$

Cevap: 4

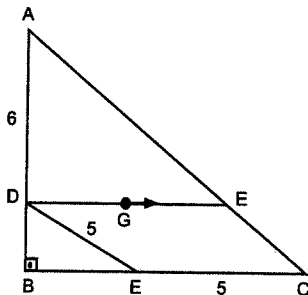
25.



$x = ?$

Cevap: 14

26.

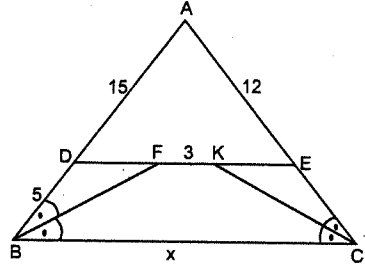


G ağırlıkmerkezi

$|DE| = ?$

Cevap: 6

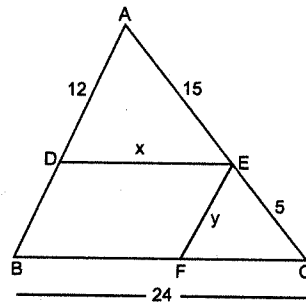
27.



$x = ?$

Cevap: 16

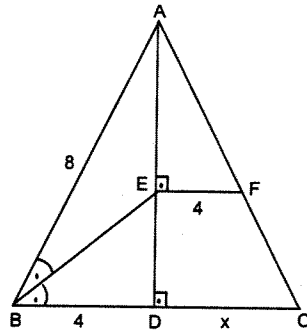
28.

BDEF paralel
kenar

$x - y = ?$

Cevap: 14

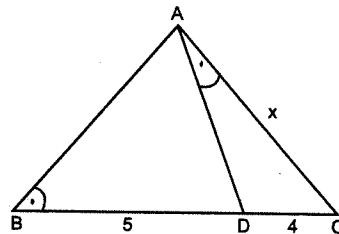
29.



$x = ?$

Cevap: 6

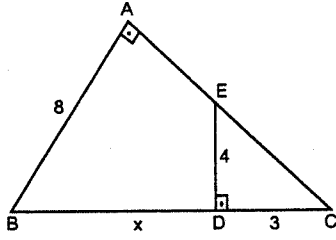
30.



$x = ?$

Cevap: 6

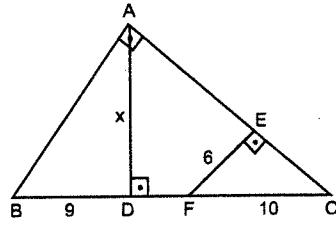
31.



$x = ?$

Cevap: 7

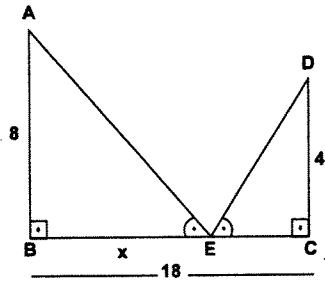
35.



$x = ?$

Cevap: 12

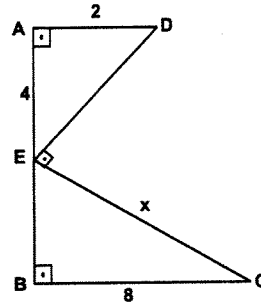
32.



$x = ?$

Cevap: 12

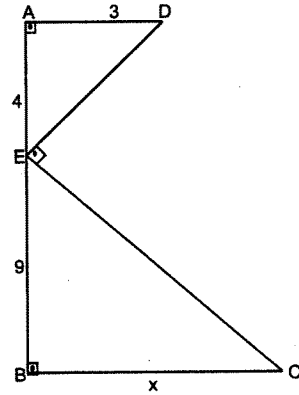
36.



$x = ?$

Cevap: $4\sqrt{5}$

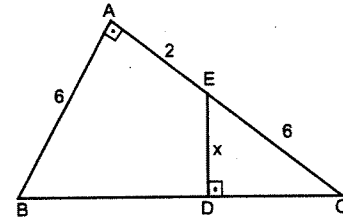
33.



$x = ?$

Cevap: 12

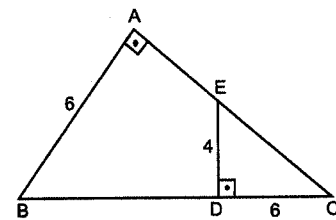
37.



$x = ?$

Cevap: $\frac{18}{5}$

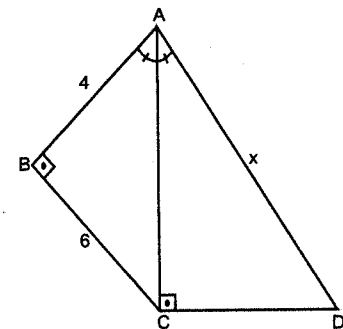
34.



$|AC| = ?$

Cevap: 9

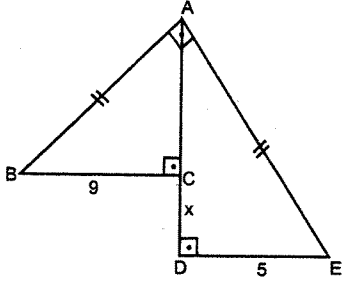
38.



$x = ?$

Cevap: 13

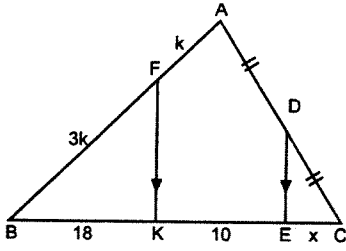
39.



$x = ?$

Cevap: 4

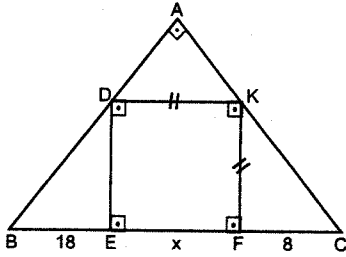
40.



$x = ?$

Cevap: 4

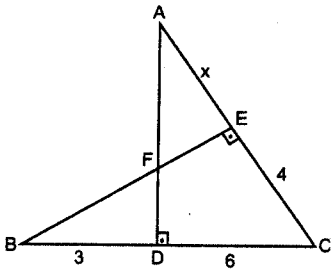
41.



$x = ?$

Cevap: 12

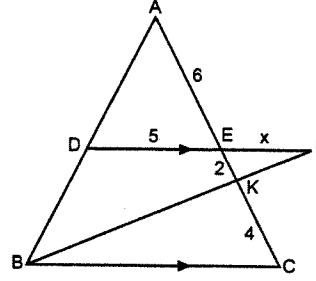
42.



$x = ?$

Cevap: $\frac{19}{2}$

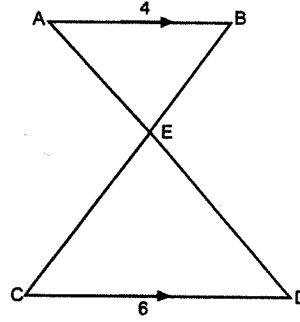
43.



$x = ?$

Cevap: 5

44.



$x = ?$

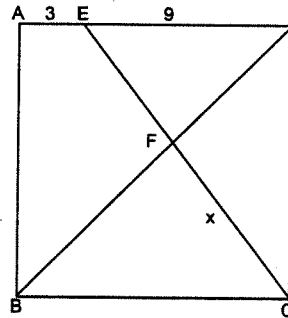
$|BC| = 10$

$|AD| = 15$

$\angle CED = ?$

Cevap: 21

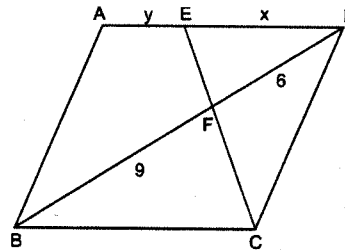
45.



ABCD kare

Cevap: $\frac{60}{7}$

46.

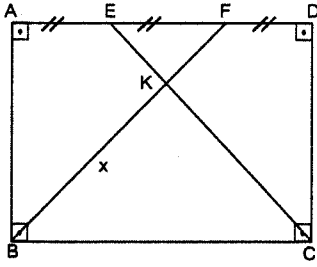


Paralelkenar

$\frac{x}{y} = ?$

Cevap: 2

47.



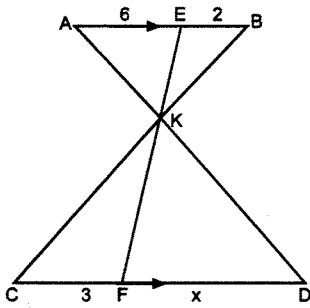
ABCD
dikdörtgen

$$|BF| = 20$$

$$x = ?$$

Cevap: 15

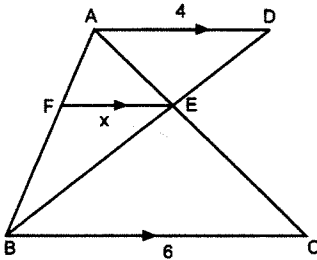
48.



$$x = ?$$

Cevap: 9

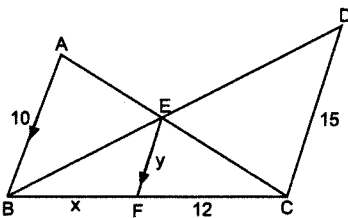
49.



$$x = ?$$

Cevap: $\frac{12}{5}$

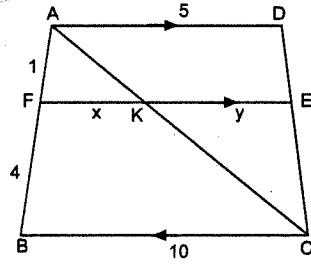
50.



$$x + y = ?$$

Cevap: 14

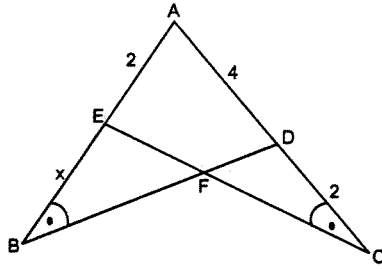
51.



$$x \cdot y = ?$$

Cevap: 8

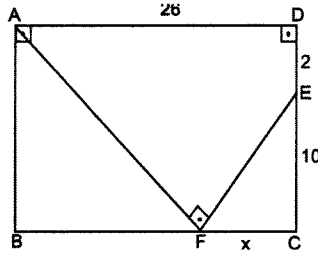
52.



$$x = ?$$

Cevap: 10

53.

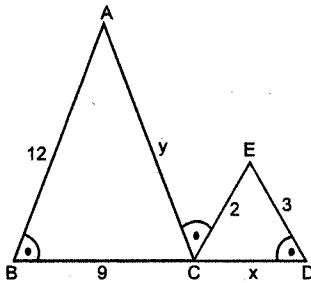


ABCD
dikdörtgen
 $|BF| < |FC|$

$$x = ?$$

Cevap: 6

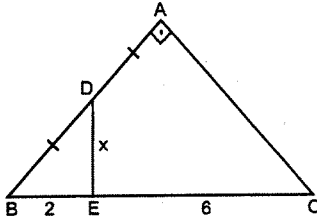
54.



$$x + y = ?$$

Cevap: 10

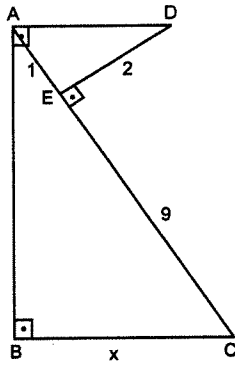
55.



$x = ?$

Cevap: 2

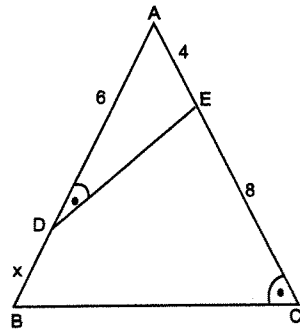
56.



$x = ?$

Cevap: $2\sqrt{5}$

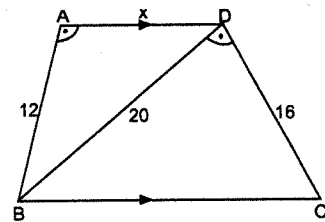
57.



$x = ?$

Cevap: 2

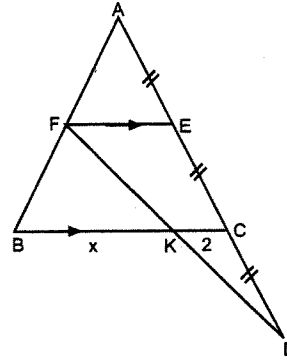
58.



$x = ?$

Cevap: 15

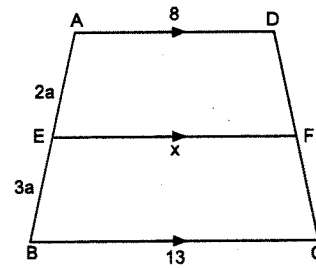
59.



$x = ?$

Cevap: 6

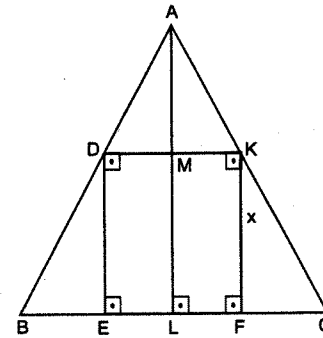
60.



$x = ?$

Cevap: 10

61.



DEFK kare

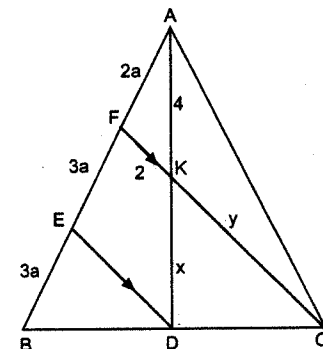
$|AL| = 15$

$|BC| = 20$

$x = ?$

Cevap: $\frac{60}{7}$

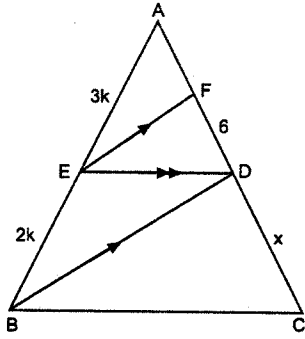
62.



$y - x = ?$

Cevap: 2

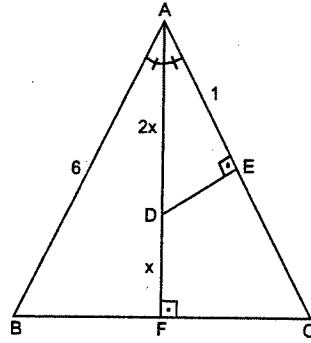
63.



$x = ?$

Cevap: 10

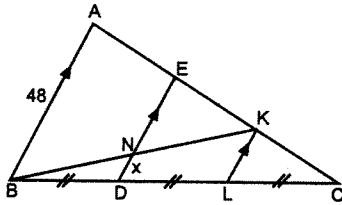
67.



$x = ?$

Cevap: 1

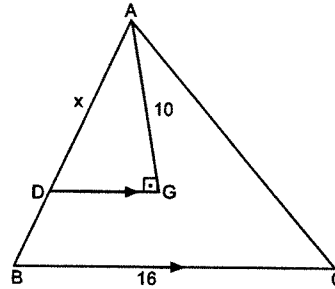
64.



$x = ?$

Cevap: 8

68.

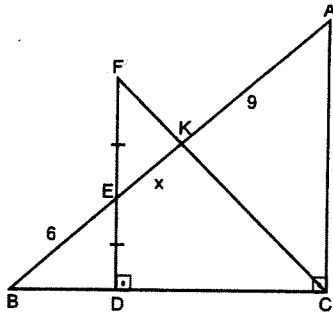


G, ağırlık merkezi

$x = ?$

Cevap: $\frac{34}{3}$

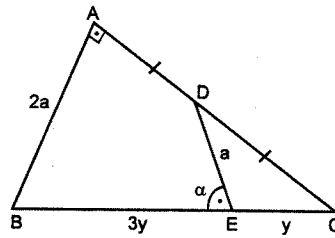
65.



$x = ?$

Cevap: 3

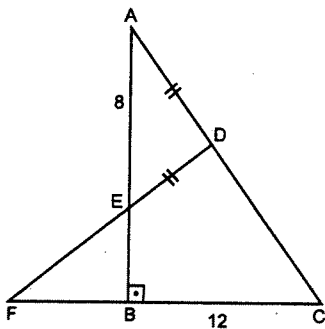
69.



$\alpha = ?$

Cevap: 60

66.

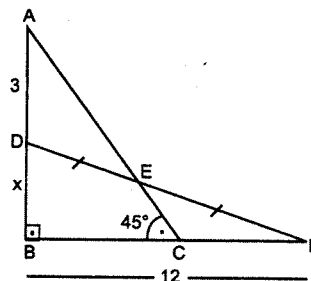


$2|ED| = |EF|$

$|AC| = ?$

Cevap: 20

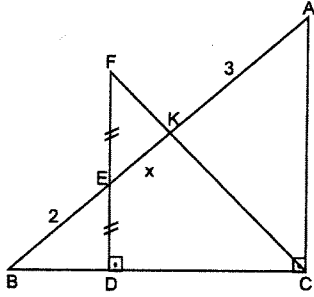
70.



$x = ?$

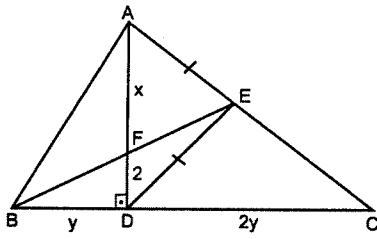
Cevap: 6

71.

 $x = ?$

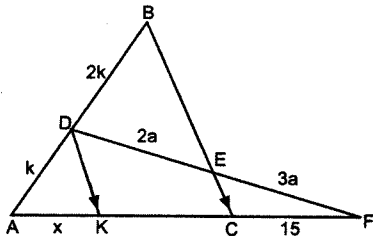
Cevap: 1

72.

 $x = ?$

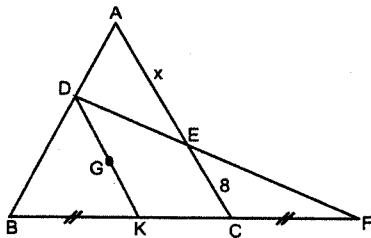
Cevap: 6

73.

 $x = ?$

Cevap: 5

74.

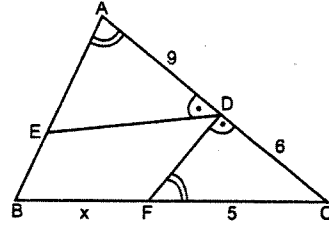
 $[DK] \parallel [AC]$

G, ağırlık merkezi

 $x = ?$

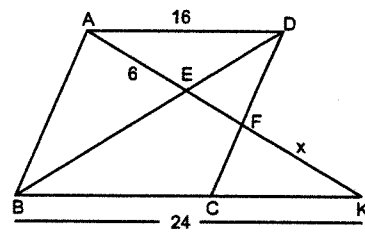
Cevap: 10

75.

 $x = ?$

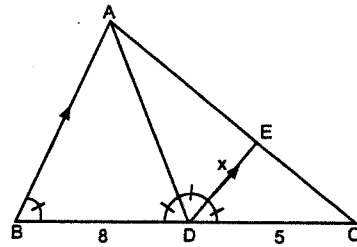
Cevap: 13

76.

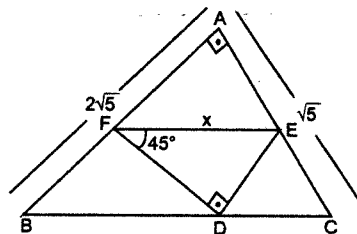
ABCD
paralelkenar $x = ?$

Cevap: 5

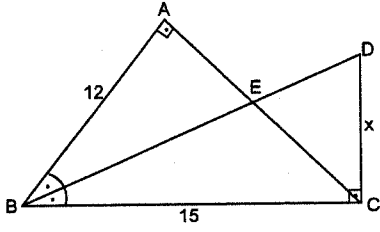
77.

 $x = ?$ Cevap: $\frac{40}{13}$

78.

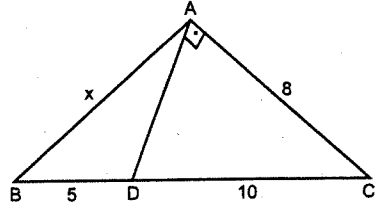
 $[FE] \parallel [BC]$ $x = ?$ Cevap: $\frac{20}{9}$

79.

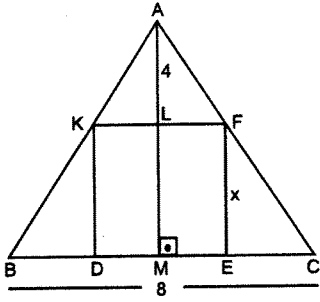
 $x = ?$

Cevap: 5

83.

 $x = ?$ Cevap: $\sqrt{97}$

80.

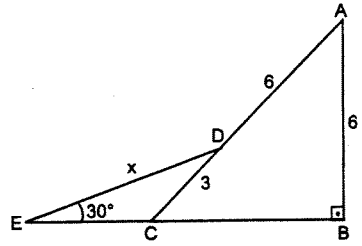


DEFK kare

 $x = ?$

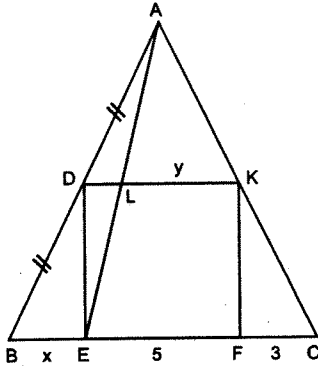
Cevap: 4

84.

 $x = ?$

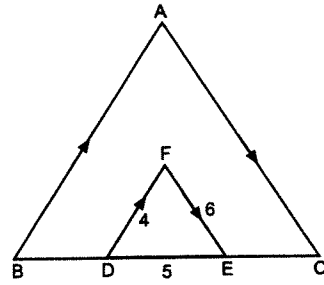
Cevap: 4

81.

DEFK
dikdörtgen $y - x = ?$

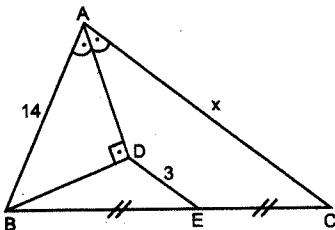
Cevap: 2

85.

F içaçıortayların
kesim noktası, $\hat{C}(\triangle ABC) = ?$

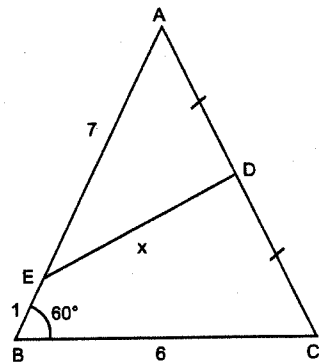
Cevap: 45

82.

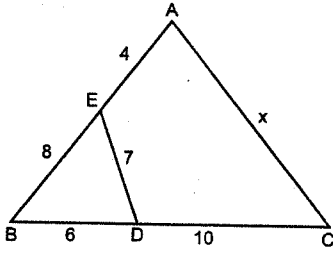
 $x = ?$

Cevap: 20

86.

 $x = ?$ Cevap: $3\sqrt{3}$

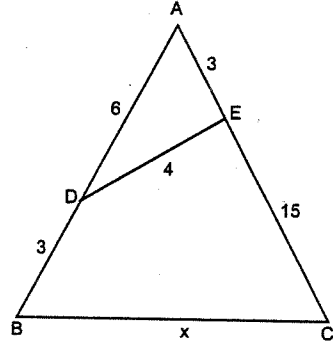
87.



$x = ?$

Cevap: 14

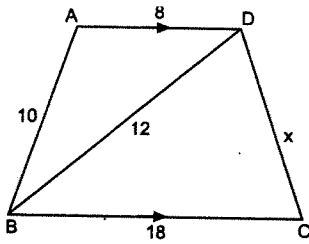
91.



$x = ?$

Cevap: 12

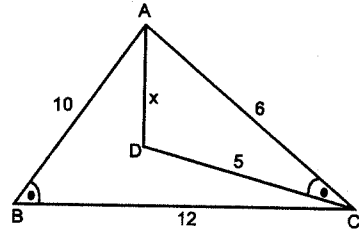
88.



$x = ?$

Cevap: 15

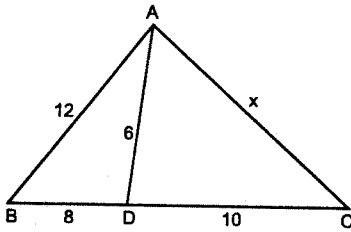
92.



$x = ?$

Cevap: 3

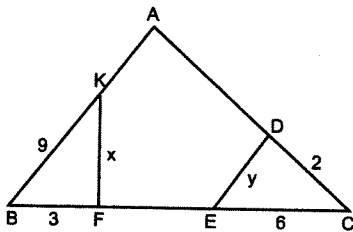
89.



$x = ?$

Cevap: 9

90.

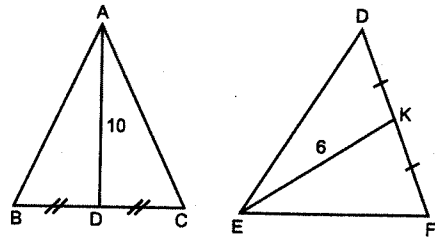


$|AB| = |AC|$

$\frac{x}{y} = ?$

Cevap: $\frac{3}{2}$

93.

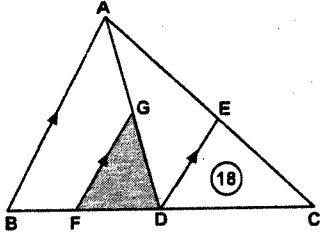


$ABC \sim EDF \Rightarrow$

$$\frac{A(\triangle ABC)}{A(\triangle EDF)} = ?$$

Cevap: $\frac{25}{9}$

94.

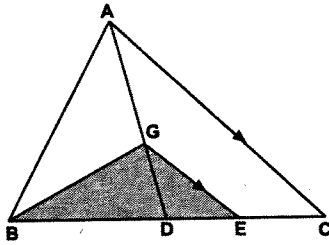


G, ağırlık merkezi

T. A = ?

Cevap: 4

95.

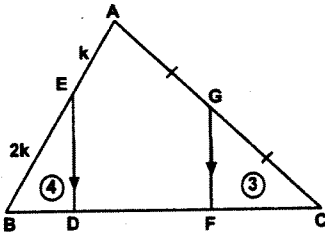


G, ağırlık merkezi

T. A = 15

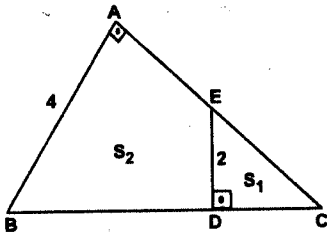
 $A(\triangle ABC) = ?$ Cevap: $\frac{135}{2}$

96.

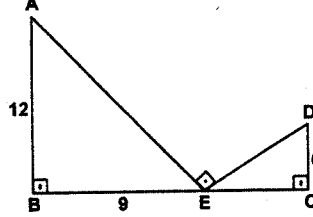
 $A(\triangle ABC) = ?$

Cevap: 21

97.

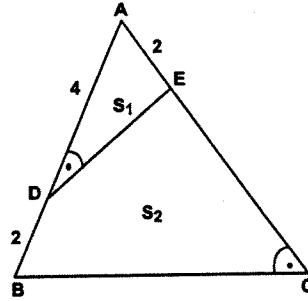
 $\frac{S_1}{S_2} = ?$ Cevap: $\frac{1}{3}$

98.

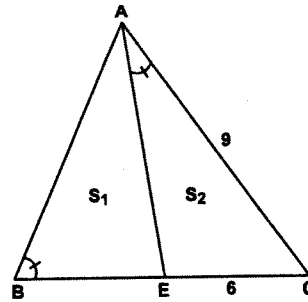
 $A(\triangle ABE) + A(\triangle DEC) = ?$

Cevap: 78

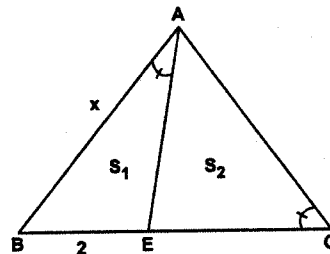
99.

 $\frac{S_1}{S_2} = ?$ Cevap: $\frac{1}{8}$

100.

 $\frac{S_1}{S_2} = ?$ Cevap: $\frac{5}{4}$

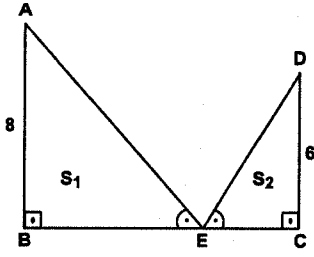
101.

 $\frac{S_1}{S_2} = \frac{1}{8}$

x = ?

Cevap: 6

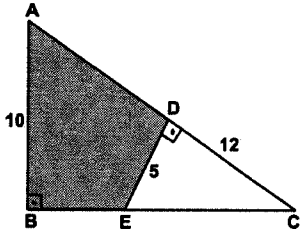
102.



$$\frac{S_1}{S_2} = ?$$

$$\text{Cevap: } \frac{16}{9}$$

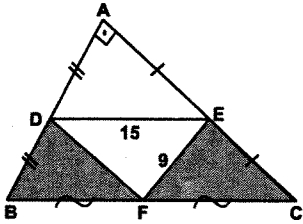
103.



$$T.A = ?$$

$$\text{Cevap: } 90$$

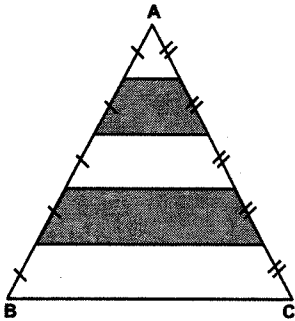
104.



$$T.A = ?$$

$$\text{Cevap: } 108$$

105.

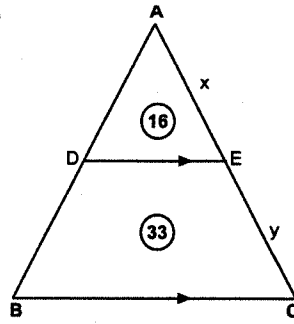


$$T.A = 15 \text{ br}$$

$$\text{Alan}(\triangle ABC) = ?$$

$$\text{Cevap: } \frac{75}{2}$$

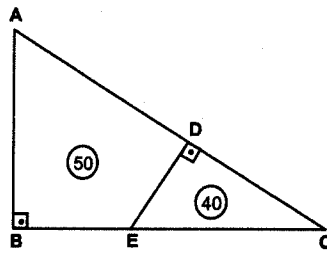
106.



$$\frac{x}{y} = ?$$

$$\text{Cevap: } \frac{4}{3}$$

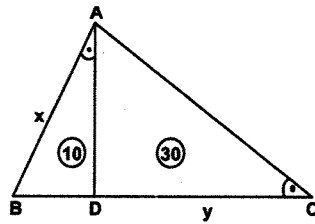
107.



$$\frac{|AB|}{|DE|} = ?$$

$$\text{Cevap: } \frac{3}{2}$$

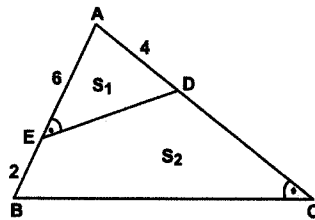
108.



$$\frac{x}{y} = ?$$

$$\text{Cevap: } \frac{2}{3}$$

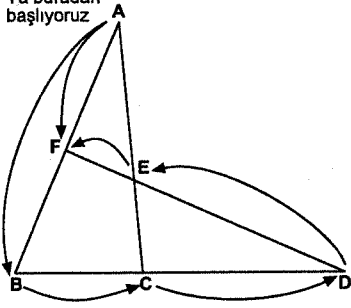
109.



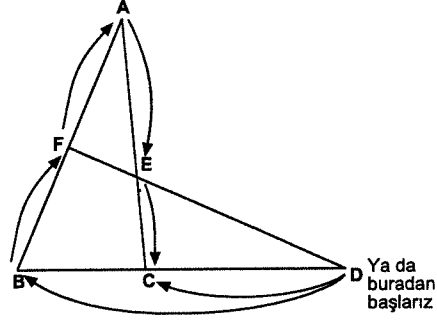
$$\frac{S_1}{S_2} = ?$$

$$\text{Cevap: } \frac{1}{3}$$

Meneleus Teoremi

Ya buradan
başlıyoruz

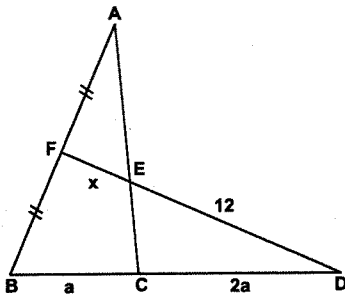
$$\frac{|AF|}{|AB|} \cdot \frac{|BC|}{|CD|} \cdot \frac{|DE|}{|EF|} = 1$$



$$\frac{|DC|}{|DB|} \cdot \frac{|BF|}{|AF|} \cdot \frac{|AE|}{|EC|} = 1$$

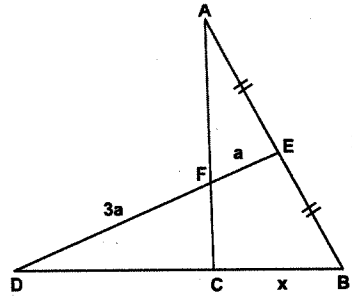
Ya da
buradan
başlarız

110.

 $x = ?$

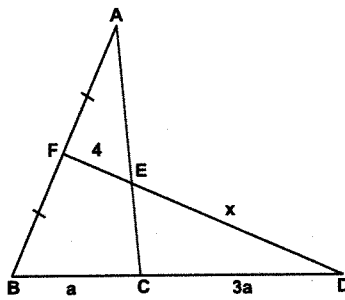
Cevap: 3

113.

 $|BD| = 15$ $x = ?$

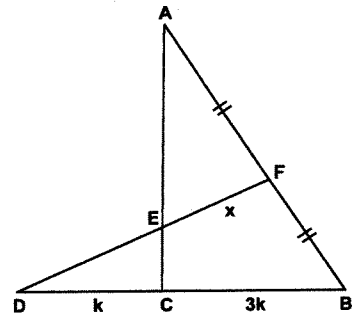
Cevap: 6

111.

 $x = ?$

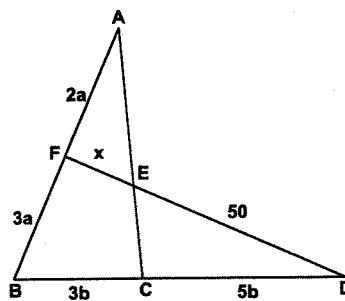
Cevap: 24

114.

 $|FD| = 20$ $x = ?$

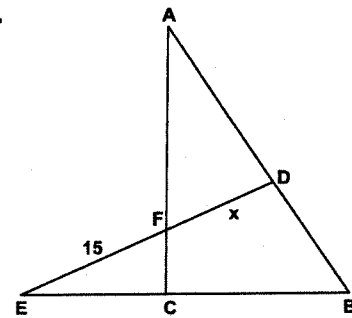
Cevap: 12

112.

 $x = ?$

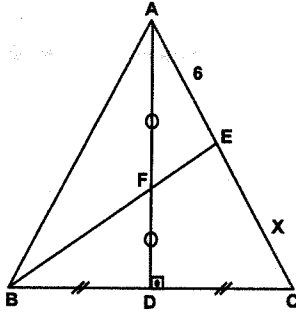
Cevap: 12

115.


 $|AD| = 4|DB|$
 $2|EC| = 3|BC|$
 $|EF| = 15 \text{ cm}$
 $x = ?$

Cevap: 8

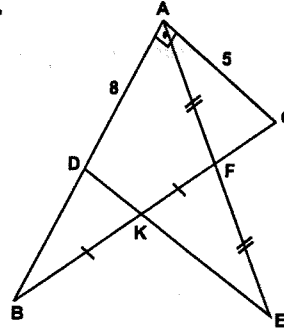
116.



$x = ?$

Cevap: 12

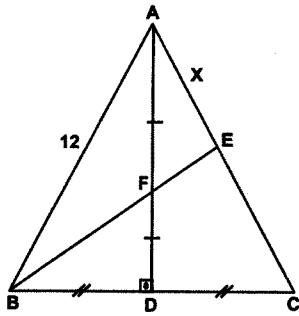
120.



$|BC| = ?$

Cevap: 13

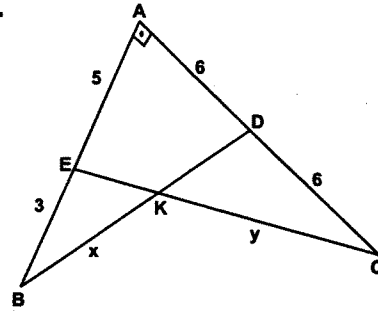
117.



$x = ?$

Cevap: 4

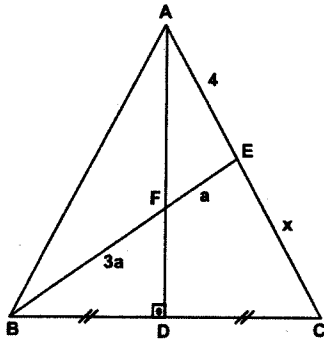
121.



$\frac{x}{y} = ?$

Cevap: $\frac{15}{26}$

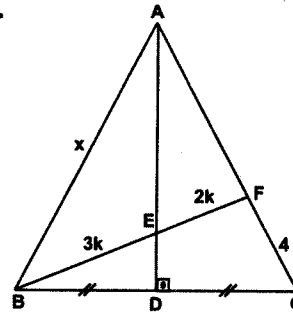
118.



$x = ?$

Cevap: 8

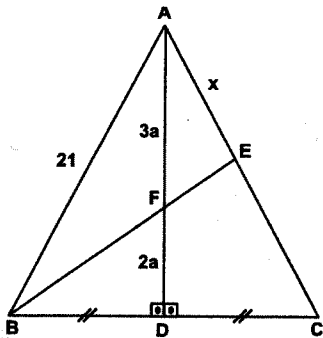
122.



$x = ?$

Cevap: 12

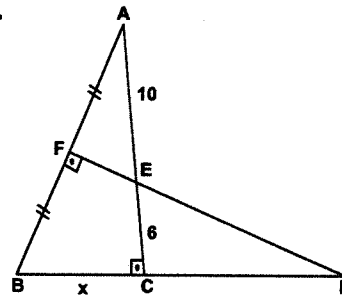
119.



$x = ?$

Cevap: 9

123.

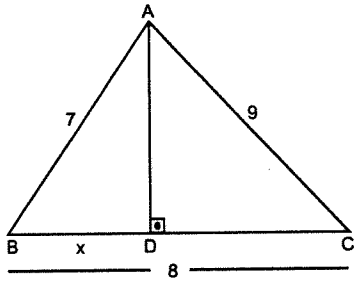


$x = ?$

Cevap: 8

ÜÇGENLER

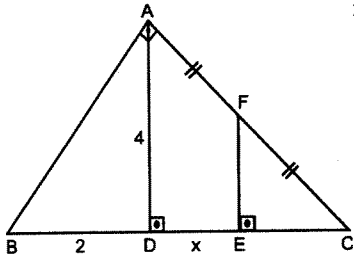
1.



$x = ?$

Cevap: 2

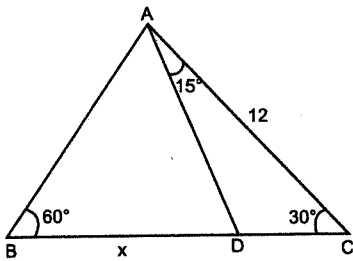
2.



$x = ?$

Cevap: 4

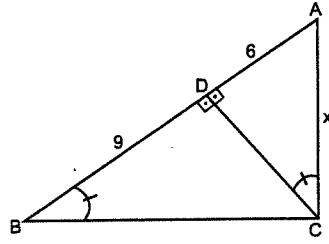
3.



$x = ?$

Cevap: $2\sqrt{3} + 6$

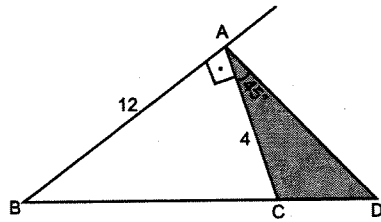
4.



$x = ?$

Cevap: $3\sqrt{10}$

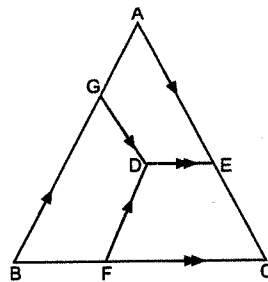
5.



$T. A = ?$

Cevap: 12

6.



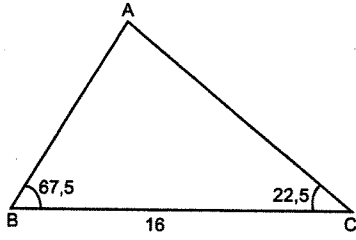
ABC eşkenar üçgen

$2 \cdot \angle(ABC) = \angle(ABC)$

$|GD| + |DE| + |DF| = ?$

Cevap: $8\sqrt{3}$

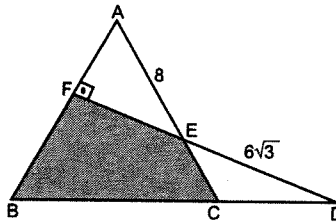
7.



$$A(\triangle ABC) = ?$$

$$\text{Cevap: } 32\sqrt{2}$$

8.

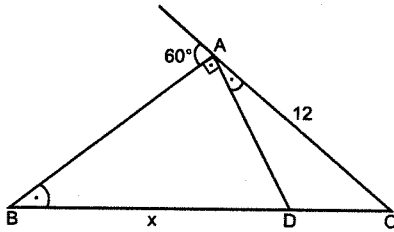


ABC eşkenar
üçgen

$$T.A = ?$$

$$\text{Cevap: } 41\sqrt{3}$$

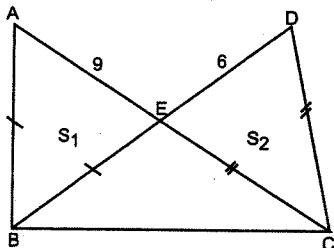
9.



$$x = ?$$

$$\text{Cevap: } 8\sqrt{3}$$

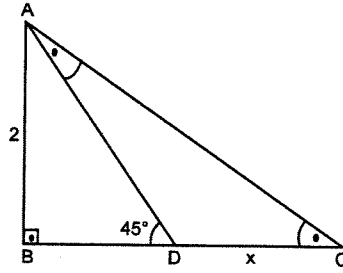
10.



$$\frac{S_1}{S_2} = ?$$

$$\text{Cevap: } \frac{9}{4}$$

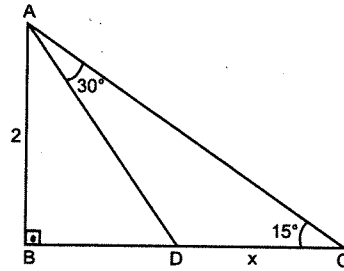
11.



$$x = ?$$

$$\text{Cevap: } 2\sqrt{2}$$

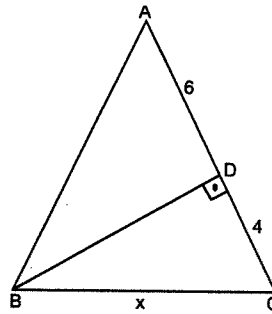
12.



$$x = ?$$

$$\text{Cevap: } 2\sqrt{3} + 2$$

13.

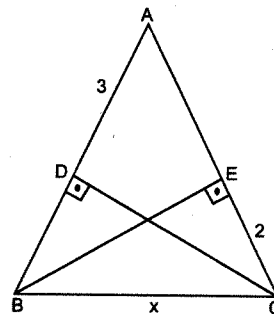


$$x = ?$$

$$|AB| = |AC|$$

$$\text{Cevap: } 4\sqrt{5}$$

14.

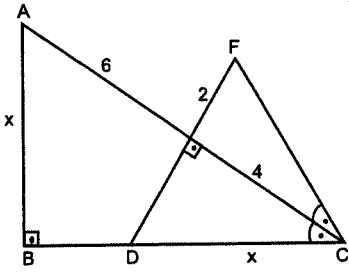


$$|DC| = |BE|$$

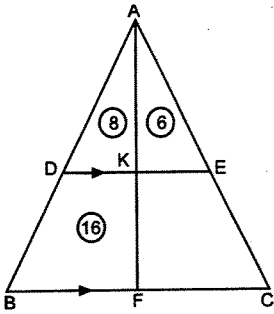
$$x = ?$$

$$\text{Cevap: } 2\sqrt{5}$$

15.

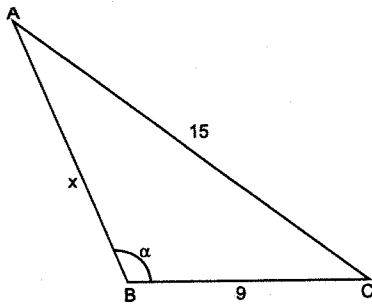
 $x = ?$ Cevap: $2\sqrt{5}$

16.

 $A(\triangle ABC) = ?$

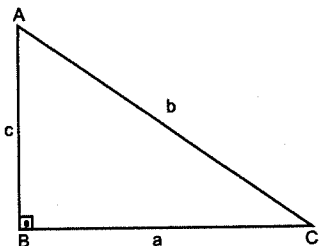
Cevap: 42

17.

 $\alpha > 90^\circ$ x in kaç tamsayı değeri vardır?

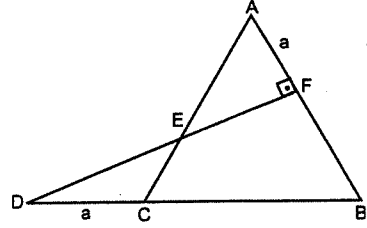
Cevap: 5

18.

 $A(\triangle ABC) = 20$ $(a-b+c) \cdot (a+c+b) = ?$

Cevap: 80

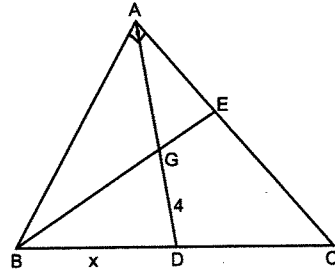
19.



ABC eşkenar üçgen

 $\angle(ABC) = 24$ $a = ?$ Cevap: $\frac{8}{3}$

20.

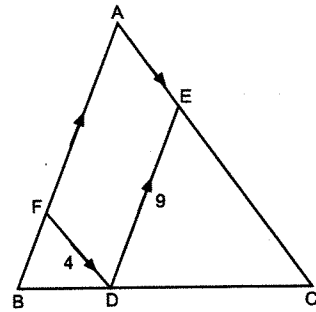


G, ağırlık merkezi

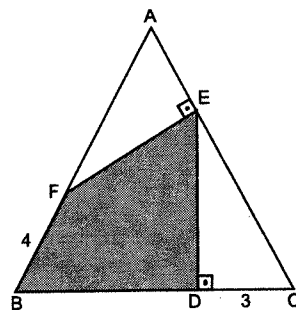
 $x = ?$

Cevap: 12

21.

 $|AB| = |AC|$ $\frac{|AE|}{|AC|} = ?$ Cevap: $\frac{4}{13}$

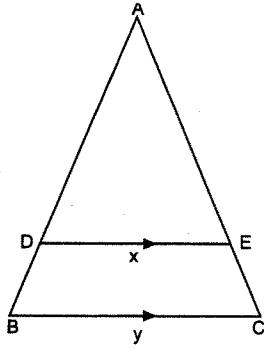
22.



ABC eşkenar üçgen

 $T.A = ?$ Cevap: $\frac{19\sqrt{3}}{2}$

23.

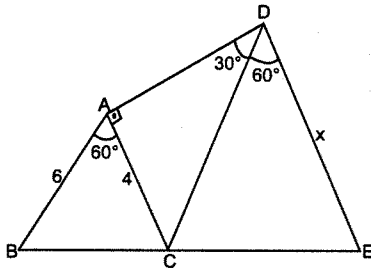


$$3x^2 + xy - 2y^2 = 0$$

$$\frac{A(\triangle ADE)}{A(\triangle ABC)} = ?$$

$$\text{Cevap: } \frac{4}{9}$$

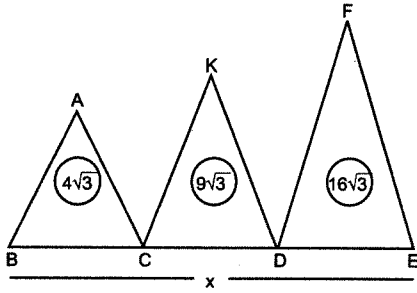
24.



$$x = ?$$

$$\text{Cevap: } \frac{16}{3}$$

25.

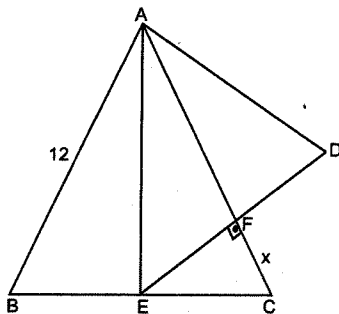


Şekiller eşkenar üçgendir.

$$x = ?$$

$$\text{Cevap: } 18$$

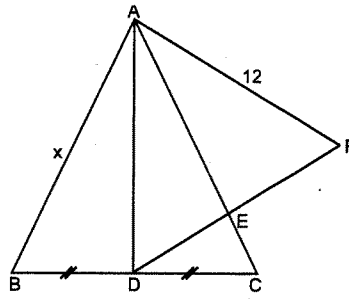
26.



ABC ve AED
eşkenar üç-
genler
 $x = ?$

$$\text{Cevap: } 3$$

27.

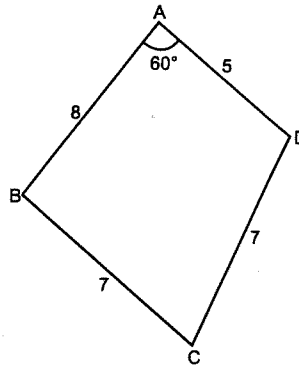


ABC ve DAF
eşkenar
üçgen

$$x = ?$$

$$\text{Cevap: } 8\sqrt{3}$$

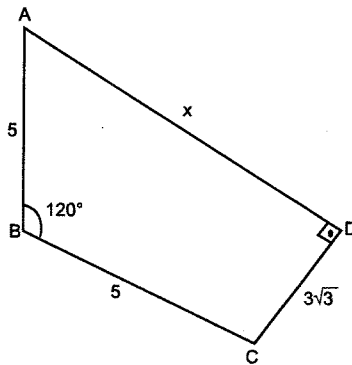
28.



$$A(ABCD) = ?$$

$$\text{Cevap: } \frac{89\sqrt{3}}{4}$$

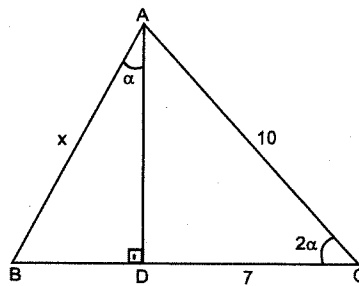
29.



$$x = ?$$

$$\text{Cevap: } 4\sqrt{3}$$

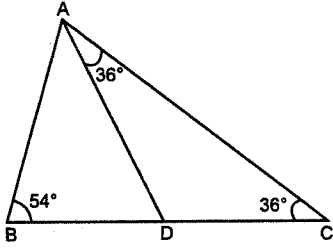
30.



$$x = ?$$

$$\text{Cevap: } 2\sqrt{15}$$

31.

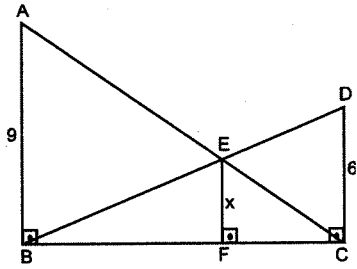


Hangisi yanlıştır?

- A) $|AD| = |DC|$ B) $|BD| = |DC|$ C) $|AD| = |BD|$
 D) $|AB| > |DC|$ E) $|BD| > |AB|$

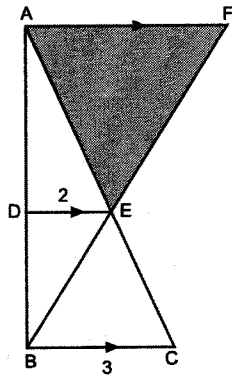
Cevap: E

32.

 $x = ?$

Cevap: 3,6

33.

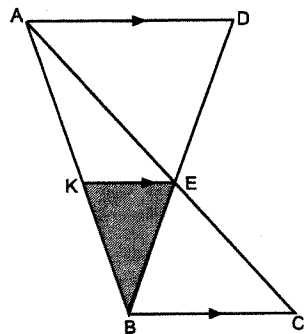


T. A = 12

 $A(\triangle BEC) = ?$

Cevap: 3

34.

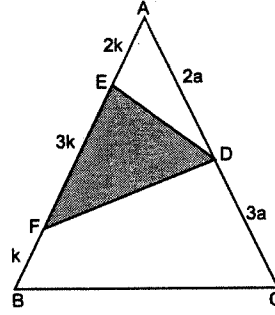


$$\frac{|AE|}{|EC|} = \frac{2}{3}$$

T. A = 12

 $A(\triangle AED) = ?$ Cevap: $\frac{40}{3}$

35.

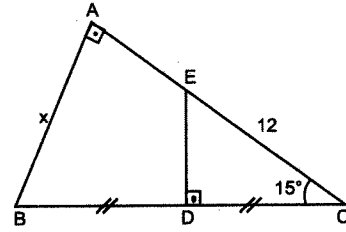


T. A = 15

 $A(\triangle ABC) = ?$

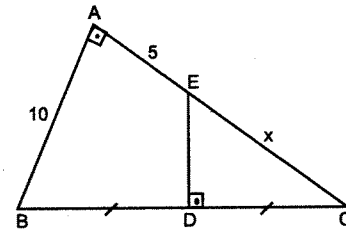
Cevap: 75

36.

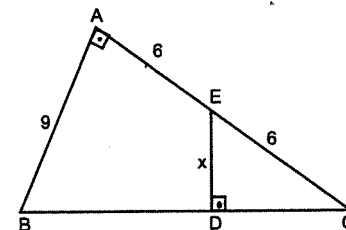
 $x = ?$

Cevap: 6

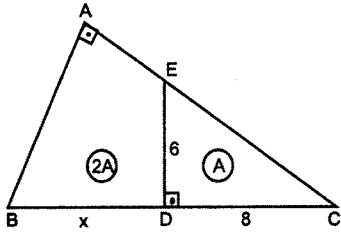
37.

 $x = ?$ Cevap: $5\sqrt{5}$

38.

 $x = ?$ Cevap: $\frac{18}{5}$

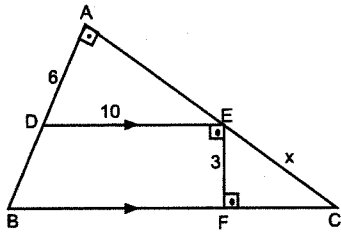
39.



$x = ?$

Cevap: $10\sqrt{3} - 8$

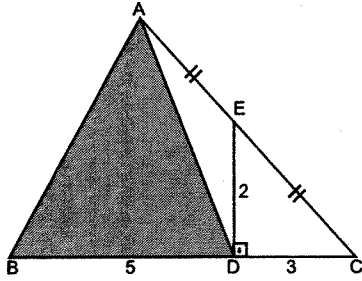
40.



$x = ?$

Cevap: 5

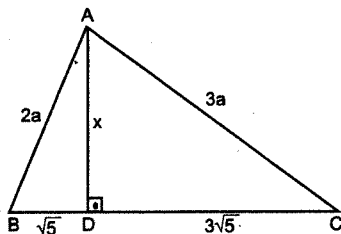
41.



$T.A = ?$

Cevap: 10

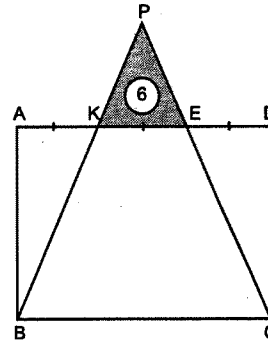
42.



$x = ?$

Cevap: $3\sqrt{3}$

43.

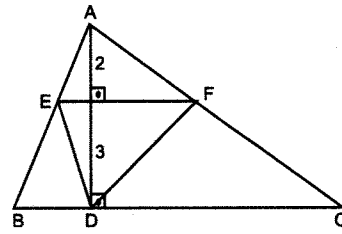


$T.A = 6$

ABCD
dikdörtgenin
alanı?

Cevap: 72

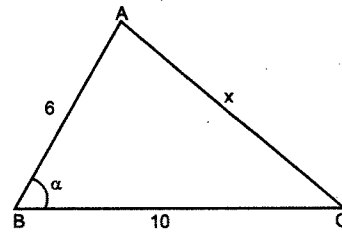
44.



$\frac{A(AEDF)}{A(ABC)} = ?$

Cevap: $\frac{2}{5}$

45.

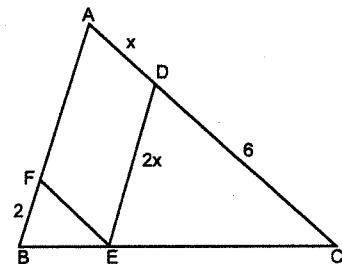


$\alpha > 60^\circ$

x in en küçük
tamsayı değeri
kaçtır?

Cevap: 9

46.



AFED
paralelkenar

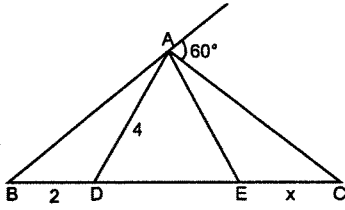
$x = ?$

Cevap: $\sqrt{6}$

47. Bir üçgenin kenar uzunluklarının ikişer ikişer toplamaları 7, 8, 9 sayıları ile orantılıdır.
Bu üçgenin alanı 54 cm^2 ise çevresi kaç cm dir?

Cevap: 36

48.

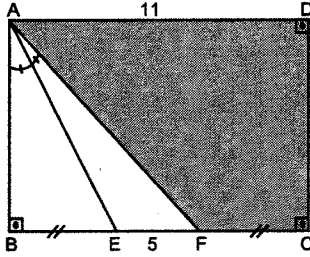


ADE eşkenar üçgen

$x = ?$

Cevap: 8

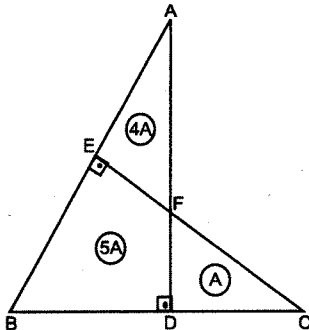
49.



T . A = ?

Cevap: 42

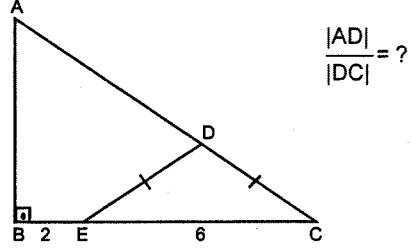
50.



$$\frac{|EF| + |FD|}{|BD|} = ?$$

Cevap: 1

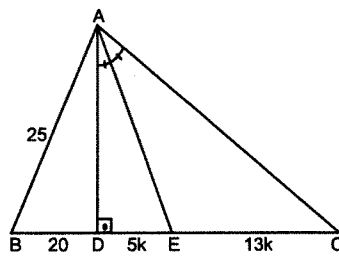
51.



$$\frac{|AD|}{|DC|} = ?$$

Cevap: $\frac{5}{3}$

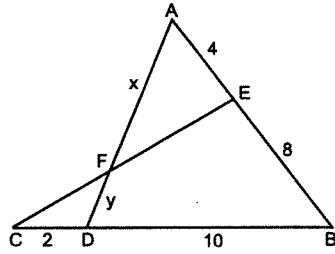
52.



$$\hat{C}(\triangle ABC) = ?$$

Cevap: 120

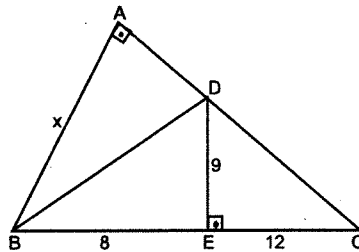
53.



$$\frac{x}{y} = ?$$

Cevap: 3

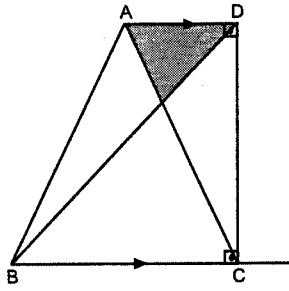
54.



$x = ?$

Cevap: 12

55.



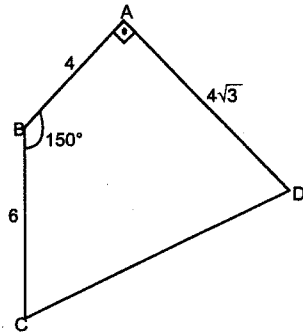
$|AB| = |AC|$

$T.A = 10$

$A(ABCD) = ?$

Cevap: 90

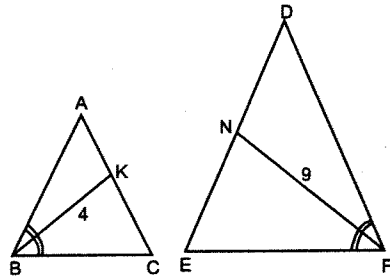
56.



$A(ABCD) = ?$

Cevap: $24 + 8\sqrt{3}$

57.

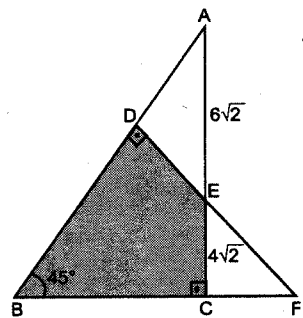


$\triangle ABC \sim \triangle DEF$

$\frac{A(\triangle ABC)}{A(\triangle DEF)} = ?$

Cevap: $\frac{16}{81}$

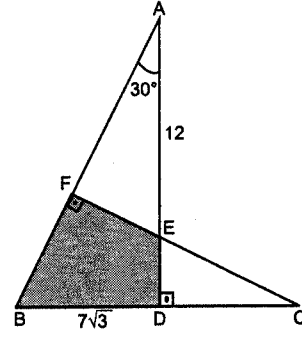
58.



$T.A = ?$

Cevap: 82

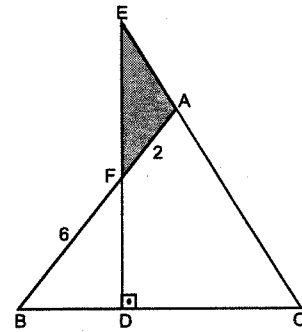
59.



$T.A = ?$

Cevap: $\frac{111\sqrt{3}}{2}$

60.

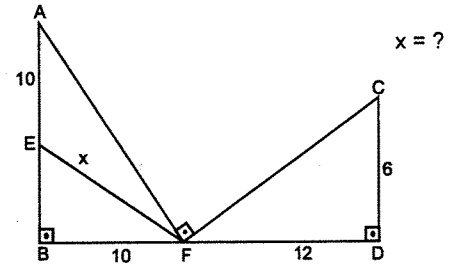


$\frac{T.A}{A(\triangle ABC)} = ?$

$|AB| = |AC|$

Cevap: $\frac{1}{16}$

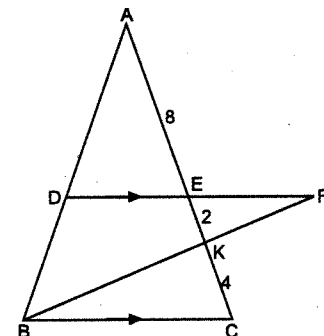
61.



$x = ?$

Cevap: $10\sqrt{2}$

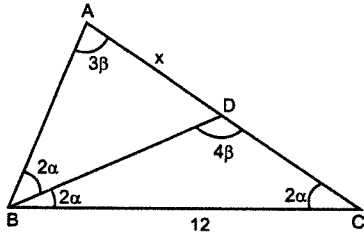
62.



$\frac{|DE|}{|EF|} = ?$

Cevap: $\frac{8}{7}$

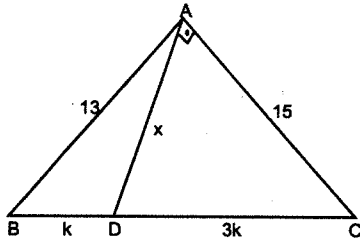
63.



$x = ?$

Cevap: $2\sqrt{3}$

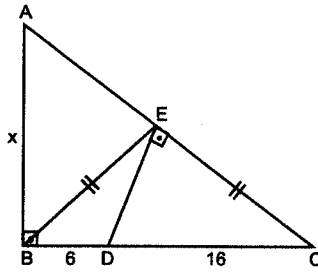
64.



$x = ?$

Cevap: 9

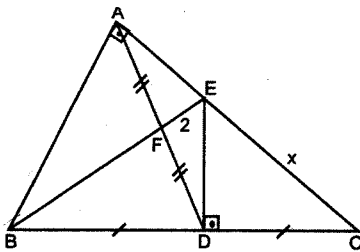
65.



$x = ?$

Cevap: $2\sqrt{55}$

66.

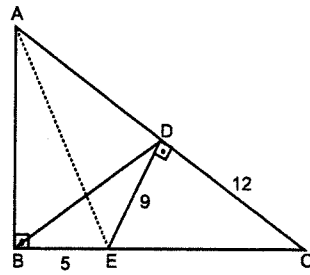


$x = ?$

$|FE| = 2 \text{ cm}$

Cevap: 8

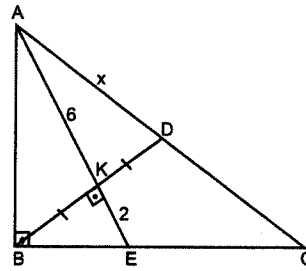
67.



$\frac{|AE|}{|AD|} = ?$

Cevap: $\frac{5\sqrt{10}}{13}$

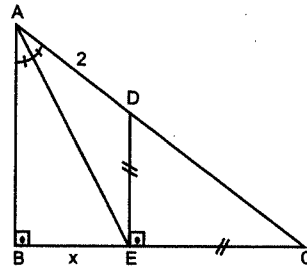
68.



$x = ?$

Cevap: $4\sqrt{3}$

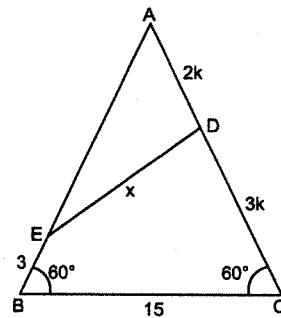
69.



$x = ?$

Cevap: $\sqrt{2}$

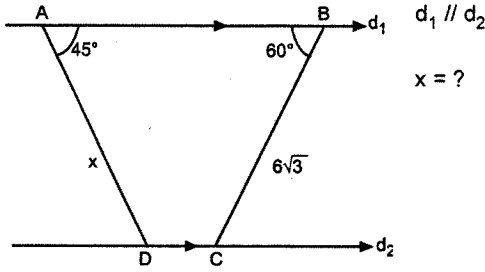
70.



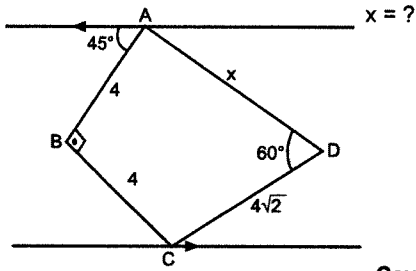
$x = ?$

Cevap: $6\sqrt{3}$

71.

Cevap: $9\sqrt{2}$

72.

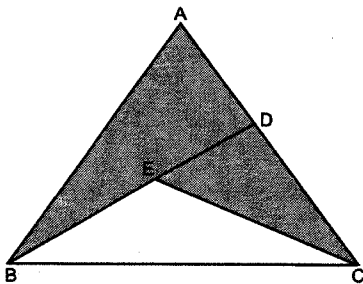
Cevap: $4\sqrt{2}$

73. 16 cm uzunluğundaki bir merdiven yer ile 30° açı yapacak şekilde, yere dik bir duvara dayandırılıyor.

Eğer 60° lik açı ile duvara dayandırılmış olsaydı, merdivenin duvara temas ettiği noktalar arasındaki uzaklık ne olurdu?

Cevap: $8\sqrt{3} - 8$

74.



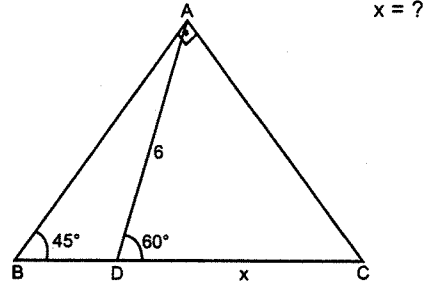
$$|BE| = 3|ED|$$

$$3|AD| = |DC|$$

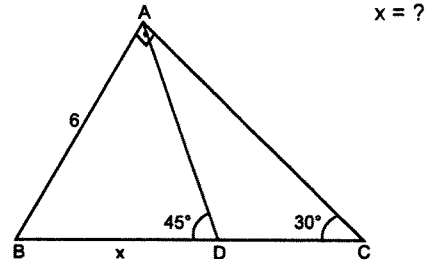
$$\frac{T.A}{A(\triangle ABC)} = ?$$

Cevap: $\frac{7}{16}$

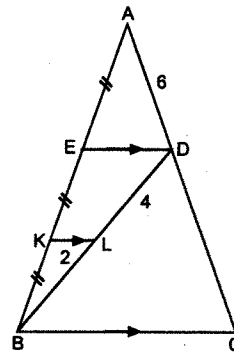
75.

Cevap: $3 + 3\sqrt{3}$

76.

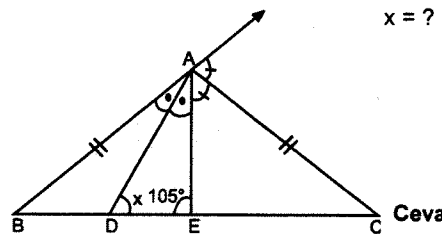
Cevap: $3 + 3\sqrt{3}$

77.



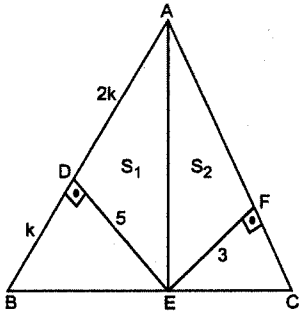
Cevap: 32

78.



Cevap: 55

79.

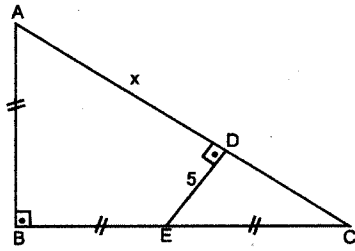


$$|AB| = |AC|$$

$$\frac{S_1}{S_2} = ?$$

$$\text{Cevap: } \frac{25}{18}$$

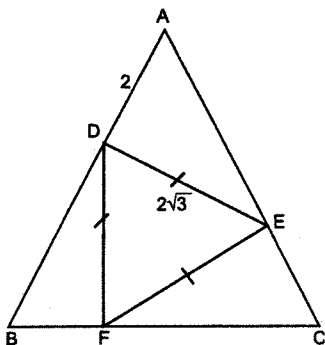
80.



$$x = ?$$

$$\text{Cevap: } 15$$

81.

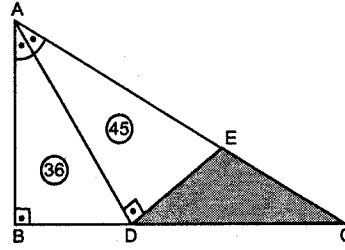


ABC eşkenar

$$A(\triangle ABC) = ?$$

$$\text{Cevap: } 9\sqrt{3}$$

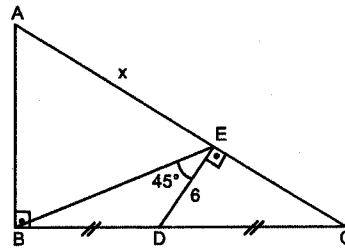
82.



$$T. A = ?$$

$$\text{Cevap: } 15$$

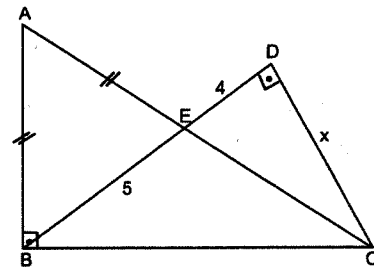
83.



$$x = ?$$

$$\text{Cevap: } 18$$

84.



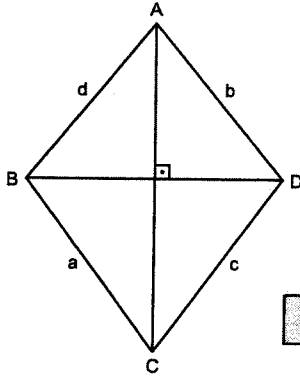
$$x = ?$$

$$\text{Cevap: } 6$$

DÖRTGENLER VE ÇOKGENLER

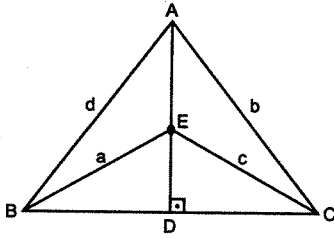
Dörtgenler

1.



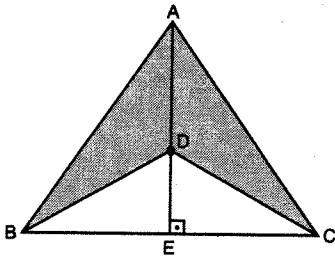
$$a^2 + b^2 = c^2 + d^2$$

2.



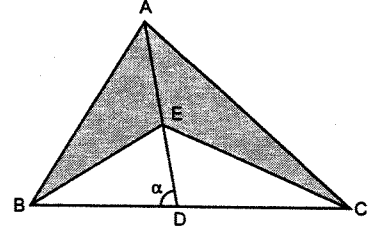
$$a^2 + b^2 = c^2 + d^2$$

3.



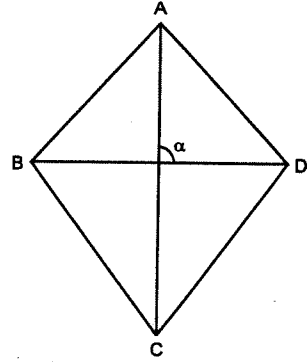
$$\text{Taralı Alan} = \frac{|AD| \cdot |BC|}{2}$$

4.



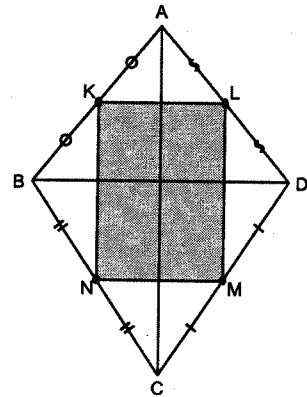
$$\text{Taralı Alan} = \frac{|AE| \cdot |BC|}{2} \cdot \sin \alpha$$

5.



$$\text{Alan}(ABCD) = \frac{|AC| \cdot |BD|}{2} \cdot \sin \alpha$$

6.



$\text{Alan}(ABCD) = 2 \cdot \text{Alan}(KLMN)$
KLMN paralelkenardır.

$$\text{Çevre}(KLMN) = |AC| + |BD|$$

Çokgenler

n: Kenar sayısı, açı sayısı, köşe sayısı olmak üzere.

n kenarlı bir çokgenin

1. İç açıları toplamı $(n-2) \cdot 180^\circ$
2. Dış açıları toplamı 360° dir.
3. Köşegen sayısı $\frac{n \cdot (n-3)}{2}$ dir.
4. Bir köşesinden çıkan köşegenler çokgeni $(n-2)$ farklı üçgene ayırır.
5. Bir köşesinden çıkan köşegen sayısı $(n-3)$ tür.
6. Bir çokgenin tek türlü olarak çizilebilmesi için $(2n-3)$ tane bağımsız bilgiye ihtiyaç vardır. Bu bilgilerin en az $(n-2)$ 'si kenar, en çok $(n-1)$ 'i açı bilgisi olmalıdır.

Düzgün Çokgen

Tüm iç açıları ve tüm kenarları birbirine eşit olan çokgenlere denir.

Bir dış açı 360° nin kenarsayısına bölünerek elde edilir.

$$\text{Dış açı} = \frac{360^\circ}{n}$$

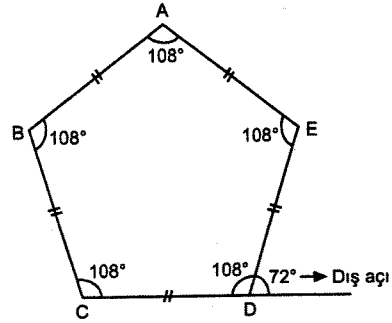
İç açı ile dış açı toplamı 180° dir.

Eşkenar üçgen, düzgün bir çokgendir.

Kare, düzgün bir çokgendir.

Düzgün Beşgen

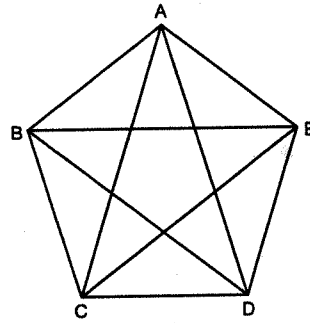
*



İç açısı 108° dir.

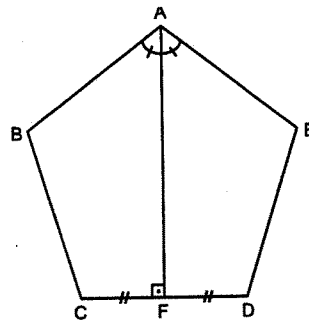
Dış açısı 72° dir.

*



Tüm köşegenleri birbirine eşittir.

*

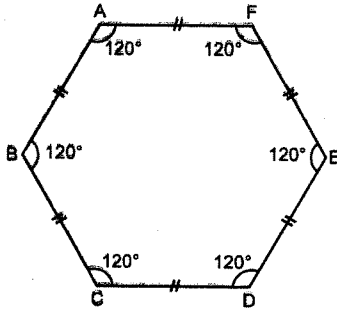


Tepeden tabana dik indirdiğimiz zaman taban iki eşit kenara, açı da eşit iki parçaya ayrılır.

Not: Açı sorularında tüm kenarların eşit olduğunu mutlaka gösterin.

Düzgün Altıgen

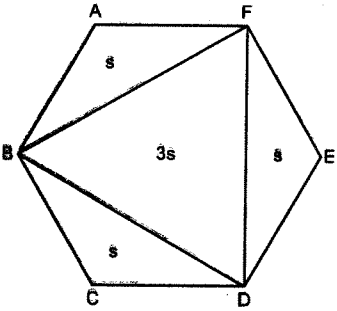
*



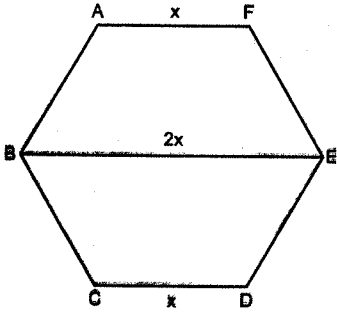
Düzgün altıgenin iç açısı 120° dir.

Dış açısı 60° dir.

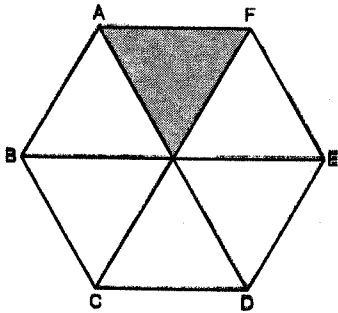
*



*



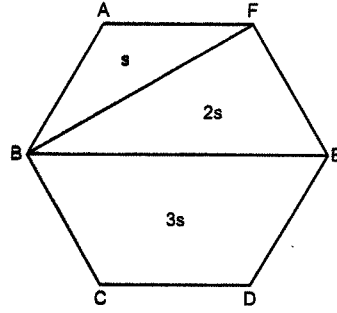
*



Bütün üçgenler eşkenar üçgendir.

$$A(ABCDEF) = \frac{6 \cdot x^2 \sqrt{3}}{4}$$

*

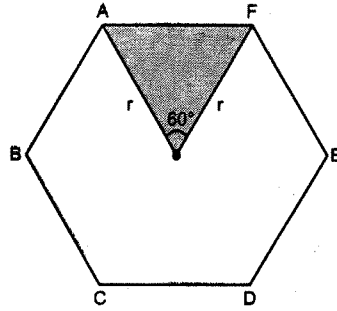


Her düzgün çokgenin etrafından bir çember geçer. Bu çemberin merkezi çokgenin ağırlık merkezidir. Bu merkezden köşelere çizilen çizgiler çemberin yarıçap uzunluğunu verir.

Düzgün altıgen, düzgün sekizgen ve düzgün onikgenin alanları sorulabilir.

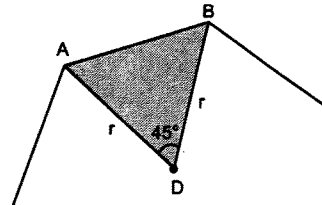
Düzgün Altıgen

*



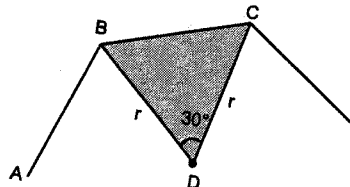
$$A(ABCDEF) = 6 \cdot \left(\frac{1}{2} \cdot r \cdot r \cdot \sin 60^\circ \right)$$

Düzgün Sekizgen



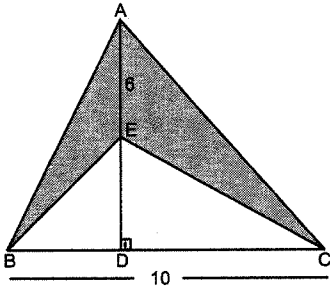
$$\text{Alan} = 8 \cdot \frac{1}{2} \cdot r \cdot r \cdot \sin 45^\circ$$

Düzgün Onikigen



$$\text{Alan} = 12 \cdot \frac{1}{2} \cdot r \cdot r \cdot \sin 30^\circ$$

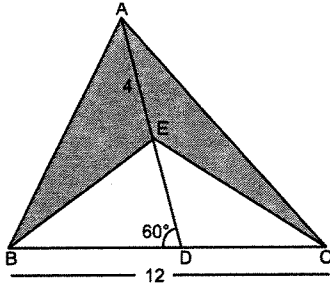
1.



T. A = ?

Cevap: 30

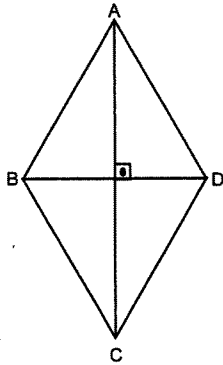
2.



T. A = ?

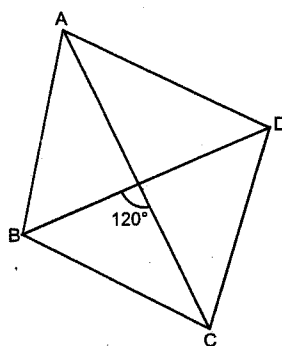
Cevap: $12\sqrt{3}$

3.

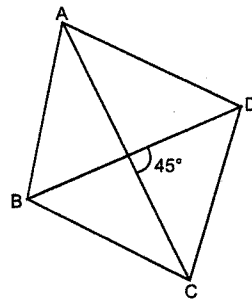
 $|AC| = 12$ $|BD| = 8$ $A(ABCD) = ?$

Cevap: 48

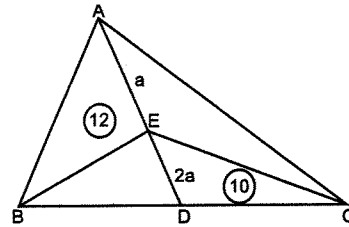
4.

 $|AC| = 16$ $|BD| = 12 \text{ cm}$ $\text{Alan}(ABCD) = ?$ Cevap: $48\sqrt{3}$

5.

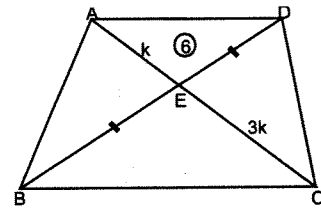
 $|AC| = 10$ $|BD| = 8$ $A(ABCD) = ?$ Cevap: $20\sqrt{2}$

6.

 $A(ABC)$

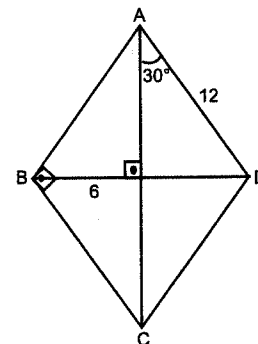
Cevap: 51

7.

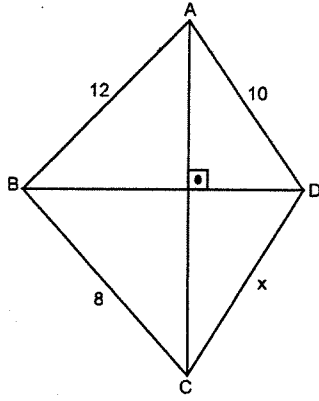
 $A(ABCD) = ?$

Cevap: 48

8.

 $A(ABCD) = ?$ Cevap: $48\sqrt{3}$

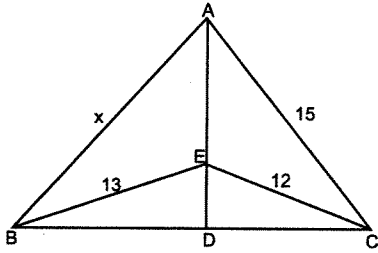
9.



$x = ?$

Cevap: $2\sqrt{5}$

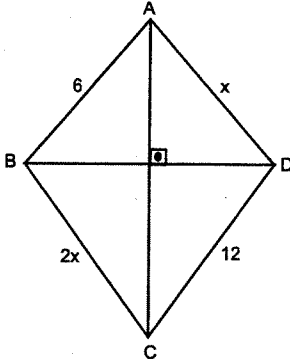
10.



$x = ?$

Cevap: $5\sqrt{10}$

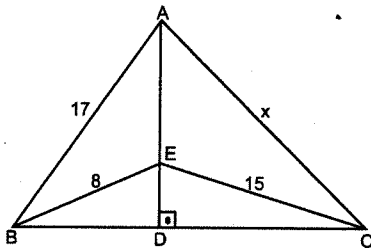
11.



$x = ?$

Cevap: 6

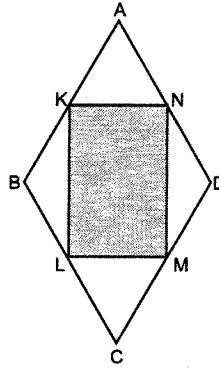
12.



$x = ?$

Cevap: $15\sqrt{2}$

13.



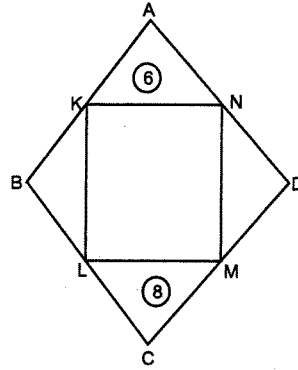
K, L, M, N
orta noktalar

$A(ABCD) = 40$

$\text{Alan}(KLMN) = ?$

Cevap: 20

14.

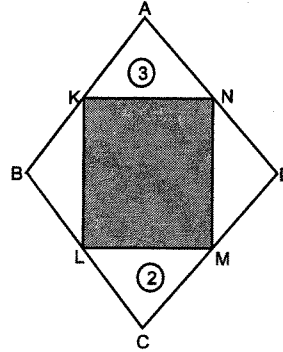


K, L, M, N
orta noktalar

$A(ABCD) = ?$

Cevap: 56

15.

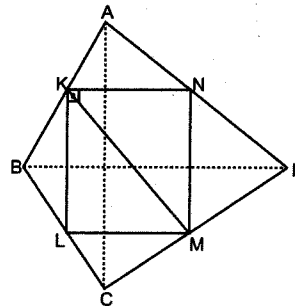


K, L, M, N
orta noktalar

$A(KLMN) = ?$

Cevap: 10

16.



K, L, M, N
orta noktalar

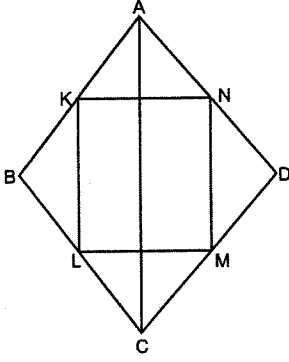
$|BD| = 12$

$|AC| = 16$

$|KM| = ?$

Cevap: 10

17.



K, L, M, N
orta noktalar

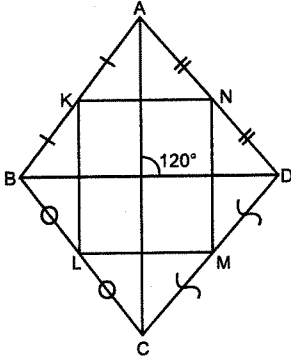
KLMN kare

$|AC| = 12$

$A(ABCD) = ?$

Cevap: 72

18.



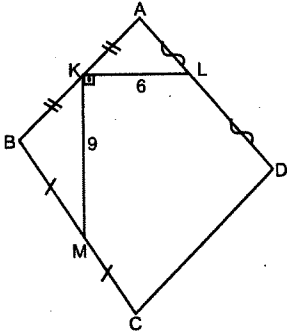
$|AC| = |BD|$

$|KN| = 6$

$A(ABCD) = ?$

Cevap: $36\sqrt{3}$

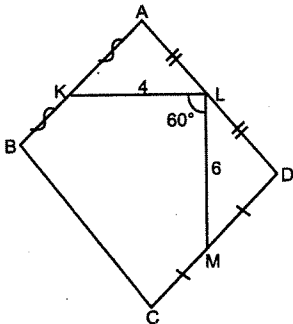
19.



$A(ABCD) = ?$

Cevap: 108

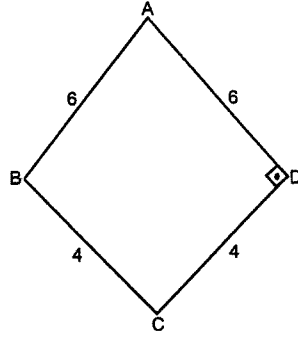
20.



$A(ABCD) = ?$

Cevap: $24\sqrt{3}$

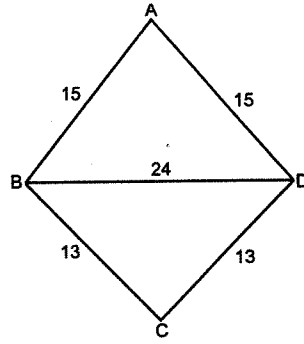
21.



$A(ABCD) = ?$

Cevap: 24

22.



$A(ABCD) = ?$

Cevap: 168

23.

Dış bükey bir çokgenin iç açılarından bazıları 120, 130, 140 ve 150° dir. Diğer iç açıları eşit olup 160° dir. Bu çokgenin kenar sayısı kaçtır?

Cevap: 13

24.

Dış açıları 1, 2, 3 ve 4 ile orantılı bir dörtgenin iç açıları hangi sayılarla orantılıdır?

Cevap: 4 : 3 : 2 : 1

25. 12 kenarlı bir çokgenin köşegen sayısı kaçtır?

Cevap: 54

26. İç açısı 144° olan bir düzgün çokgenin köşegen sayısı kaçtır?

Cevap: 35

27. İç açısı 165° olan bir düzgün çokgenin köşegen sayısı kaçtır?

Cevap: 252

28. İç açısı dış açısının 4 katından 20° eksik olan düzgün çokgenin kenar sayısı kaçtır?

Cevap: 9

29. İç açısı ile dış açısının farkı 120° olan düzgün çokgenin kenar sayısı kaçtır?

Cevap: 12

30. İç açısı 168° olan düzgün çokgenin bir köşesinden çıkan köşegenler çokgeni kaç farklı üçgene ayırır?

Cevap: 28

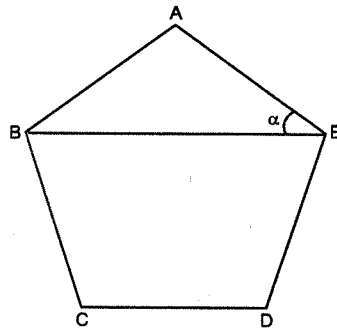
31. Köşegen sayısının kenar sayısına oranı 6 olan düzgün çokgenin iç açısı kaçtır?

Cevap: 156

32. İç açısı 172° olan düzgün bir çokgenin köşegen sayısının kenar sayısına oranı kaçtır?

Cevap: 21

33.

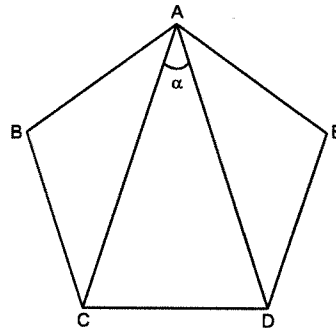


Düğüün beşgen

$\alpha = ?$

Cevap: 36

34.

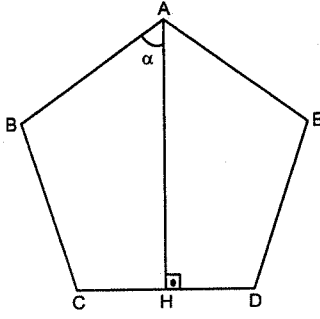


Düğüün beşgen

$\alpha = ?$

Cevap: 36

35.

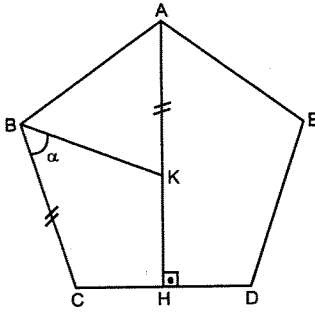


Düzgün beşgen

 $\alpha = ?$

Cevap: 54

36.

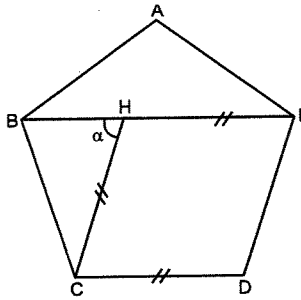


Düzgün beşgen

 $\alpha = ?$

Cevap: 45

37.

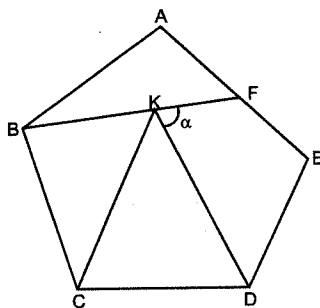


Düzgün beşgen

 $\alpha = ?$

Cevap: 72

38.



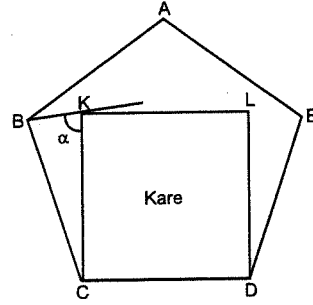
Düzgün beşgen

KCD eşkenar üçgen

 $\alpha = ?$

Cevap: 54

39.

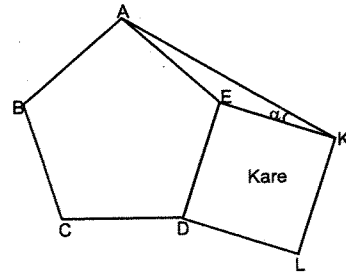


Düzgün beşgen

 $\alpha = ?$

Cevap: 81

40.

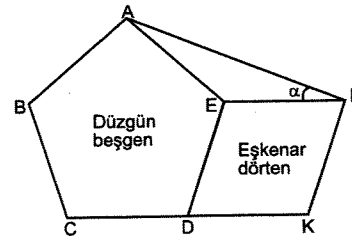


Düzgün beşgen

 $\alpha = ?$

Cevap: 9

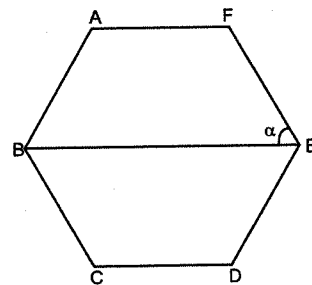
41.

 $\alpha = ?$

Cevap: 18

Not: (42-58) soruları içerisindeki şekiller DÜZGÜN ALTİGEN'dir.

42.

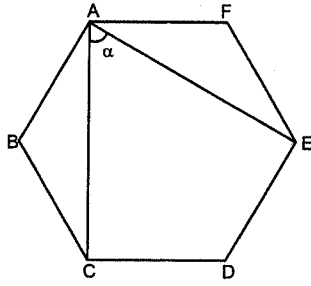


Düzgün altıgen

 $\alpha = ?$

Cevap: 60

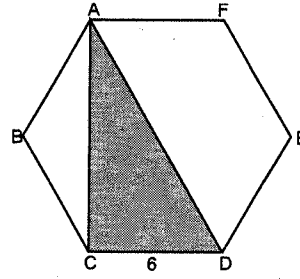
43.



$\alpha = ?$

Cevap: 60

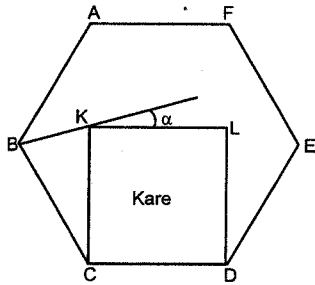
47.



$T.A = ?$

Cevap: $18\sqrt{3}$

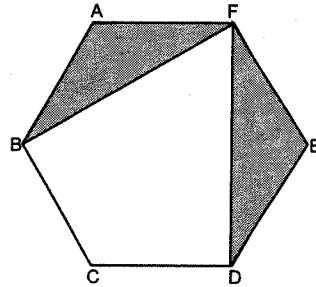
44.



$\alpha = ?$

Cevap: 15

48.

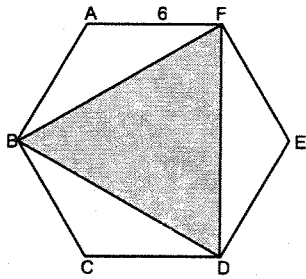


$T.A = 8\sqrt{3}$

$\angle(ABCDEF) = ?$

Cevap: 24

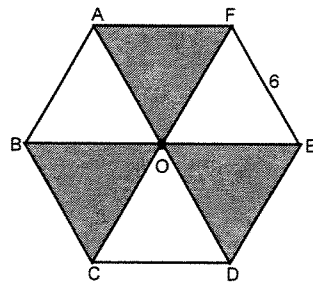
45.



$T.A = ?$

Cevap: $27\sqrt{3}$

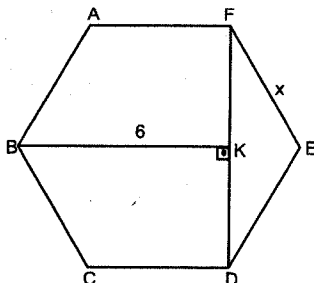
49.



$T.A = ?$

Cevap: $27\sqrt{3}$

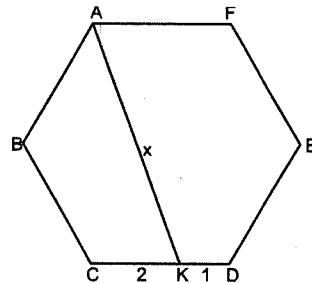
46.



$x = ?$

Cevap: 4

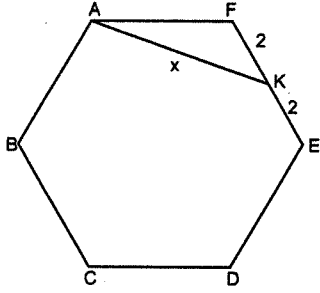
50.



$x = ?$

Cevap: $\sqrt{31}$

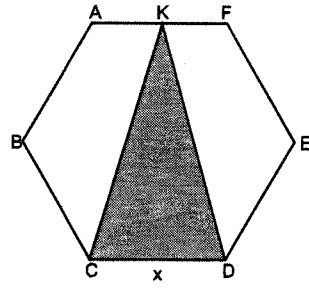
51.



$$x = ?$$

Cevap: $2\sqrt{7}$

55.

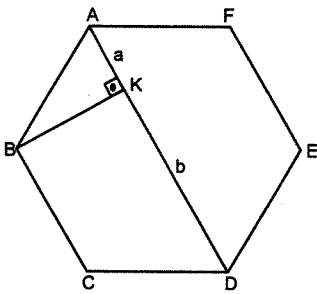


$$T.A = 18\sqrt{3}$$

$$x = ?$$

Cevap: 6

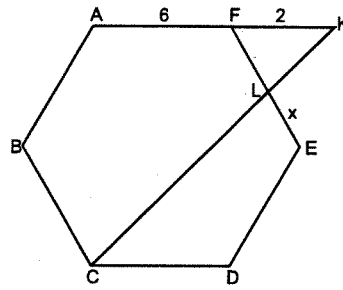
52.



$$\frac{a}{b} = ?$$

Cevap: $\frac{1}{3}$

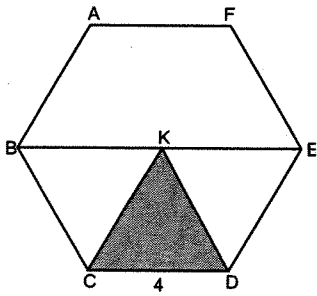
56.



$$x = ?$$

Cevap: $\frac{30}{7}$

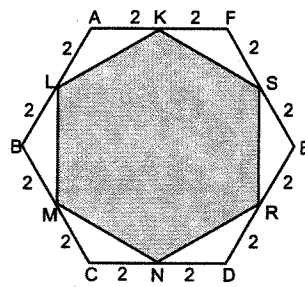
53.



$$T.A = ?$$

Cevap: $4\sqrt{3}$

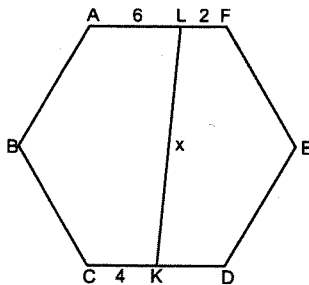
57.



$$T.A = ?$$

Cevap: $18\sqrt{3}$

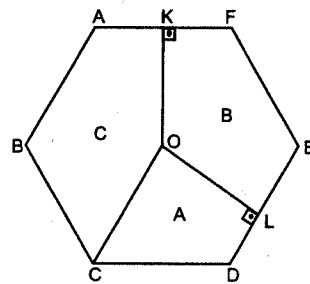
54.



$$x = ?$$

Cevap: 14

58.

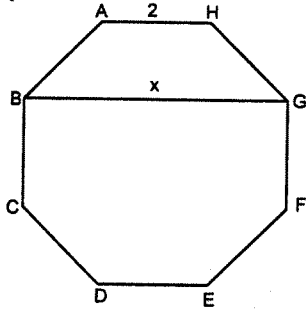
O ağırlık
merkezi

$$\frac{A+B}{C} = ?$$

Cevap: $\frac{7}{5}$

Not: (59-67) soruları içerisindeki şekiller DÜZGÜN SEKİZGEN'dir.

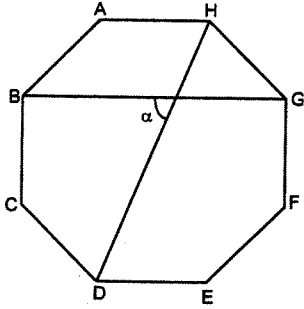
59. •



$x = ?$

$\text{Cevap: } 2\sqrt{2} + 2$

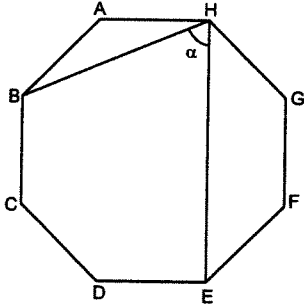
60.



$\alpha = ?$

$\text{Cevap: } 67,5$

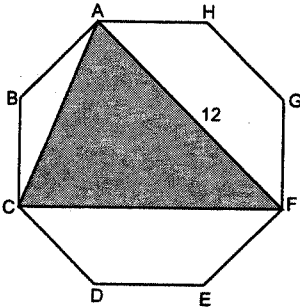
61.



$\alpha = ?$

$\text{Cevap: } 67,5$

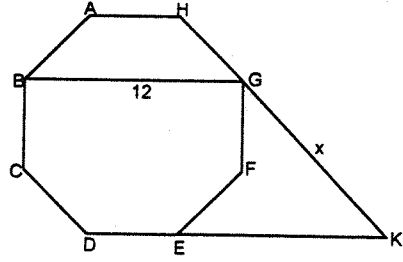
62.



$T.A = ?$

$\text{Cevap: } 36\sqrt{2}$

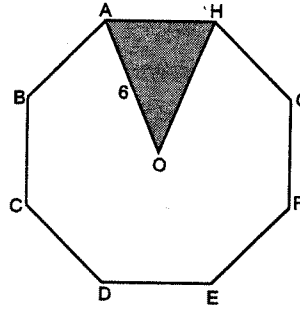
63.



$x = ?$

$\text{Cevap: } 12$

64.

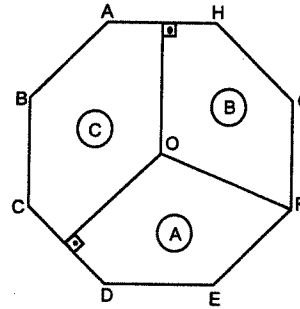


$T.A = ?$

O ağırlık merkezi

$\text{Cevap: } 9\sqrt{2}$

65.

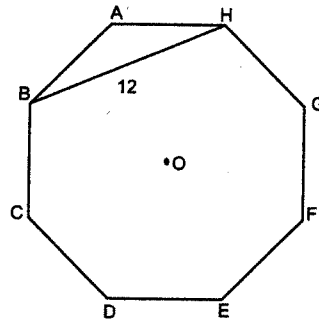


O ağırlık merkezi

$\frac{C+B}{A} = ?$

$\text{Cevap: } \frac{11}{5}$

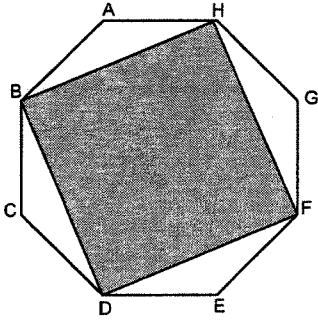
66.



$A(ABCDEFGH) = ?$

$\text{Cevap: } 144\sqrt{2}$

67.

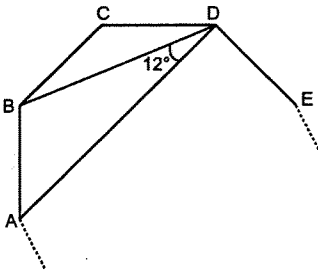


T . A = ?

 $|BH| = 6$ cm

Cevap: 36

68.

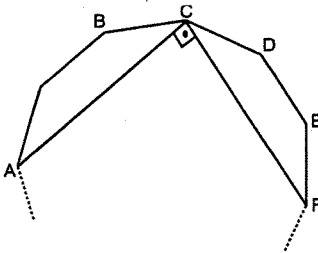


Düzgün çokgen

kaç kenarlıdır?

Cevap: 15

69.

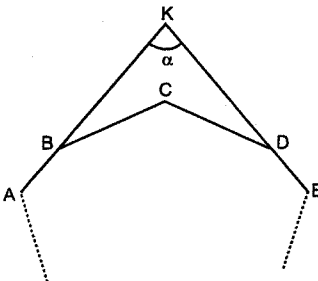


Düzgün çokgen

kaç kenarlıdır?

Cevap: 12

70.



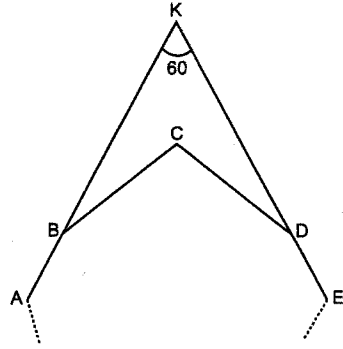
ABCDE

Düzgün onikigen

 $\alpha = ?$

Cevap: 90

71.



ABCDE

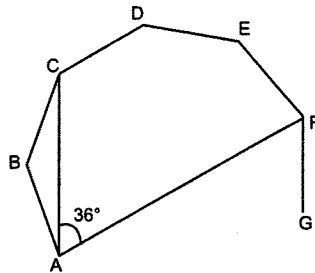
Düzgün

çokgen

kaç kenarlıdır?

Cevap: 9

72.



Düzgün çokgen

kaç kenarlıdır?

Cevap: 15

73. İç teğet çemberinin yarıçapı $4\sqrt{3}$ cm olan düzgün altıgenin alanı kaç cm^2 dir?

Cevap: $96\sqrt{3}$

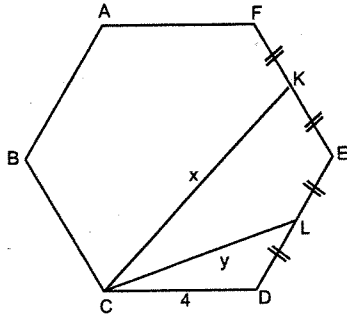
74. Çevrel çemberin yarıçapı 4 cm olan düzgün sekizgenin alanı kaçtır?

Cevap: $32\sqrt{2}$

75. Çevrel çemberinin yarıçapı 4 cm olan düzgün onikigenin alanı kaçtır?

Cevap: 48

76.

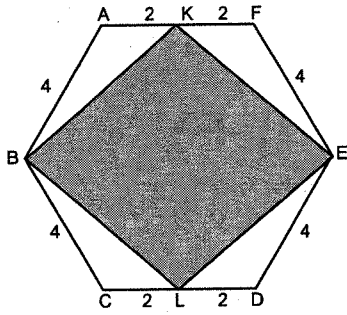


$$\frac{x}{y} = ?$$

Düzgün altıgen

$$\text{Cevap: } \frac{\sqrt{13}}{\sqrt{7}}$$

77.

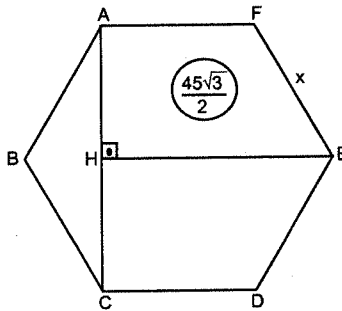


$$T.A = ?$$

Düzgün altıgen

$$\text{Cevap: } 16\sqrt{3}$$

78.

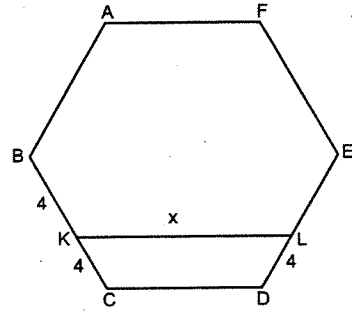


$$x = ?$$

Düzgün altıgen

$$\text{Cevap: } 6$$

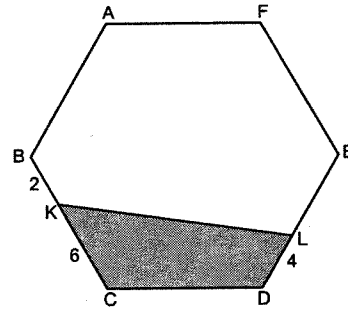
79.



ABCDEF
Düzgün altıgen
 $x = ?$

$$\text{Cevap: } 12$$

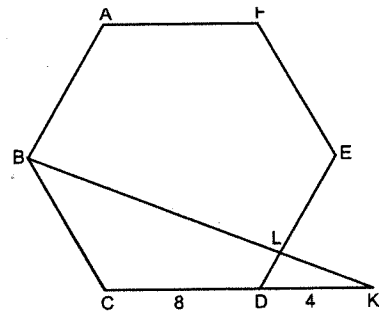
80.



ABCDEF
Düzgün altıgen
 $T.A = ?$

$$\text{Cevap: } 26\sqrt{3}$$

81.



ABCDEF

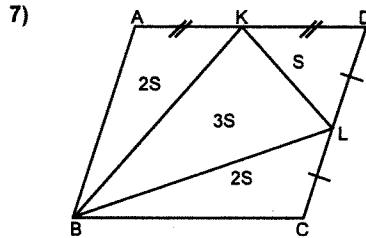
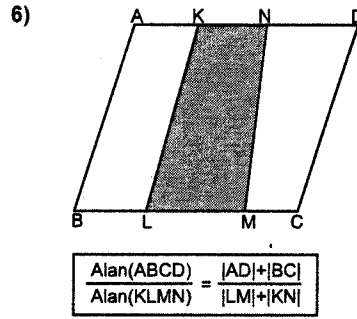
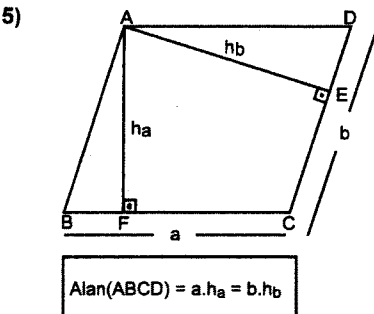
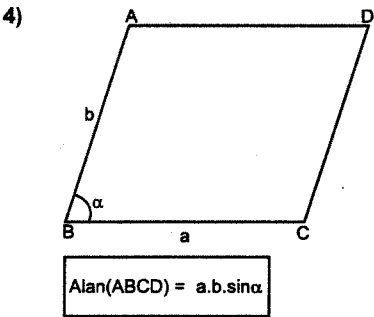
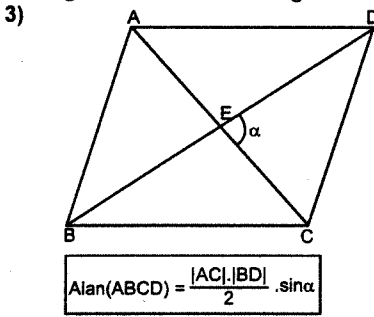
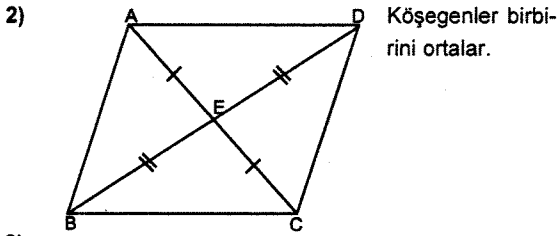
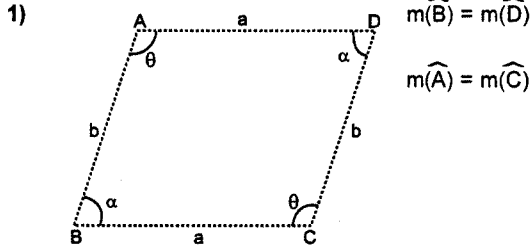
Düzgün altıgen

$$\frac{|LE|}{|LD|} = ?$$

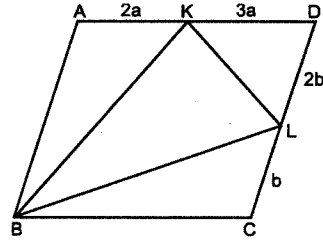
$$\text{Cevap: } 4$$

PARALELKENAR

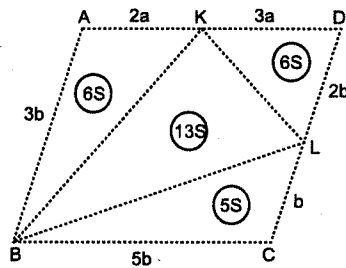
Karşılıklı kenarları birbirine paralel ve eşit olan düğüne paralelkenar denir.



Örnek



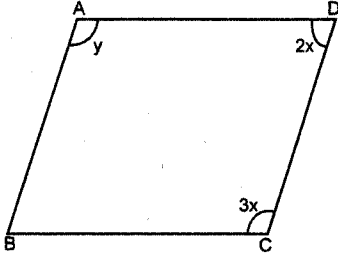
Şimdi bu bölgeleri S'liyelim.



$$\left. \begin{aligned} A(\widehat{BAK}) &= 2a \cdot 3b = 6ab = 6S \\ A(\widehat{KDL}) &= 3a \cdot 2b = 6ab = 6S \\ A(\widehat{BCL}) &= 5a \cdot b = 5ab = 5S \end{aligned} \right\} 17S$$

$$A(\text{ABCD}) = (3b \cdot 5a) \times 2 = 30ab = 30S$$

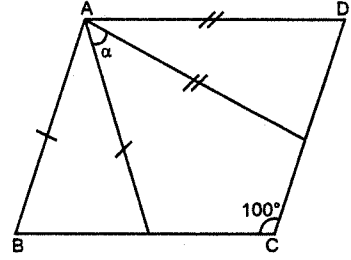
1.



$$y - x = ?$$

Cevap: 72

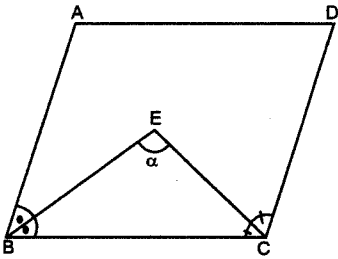
5.



$$\alpha = ?$$

Cevap: 60

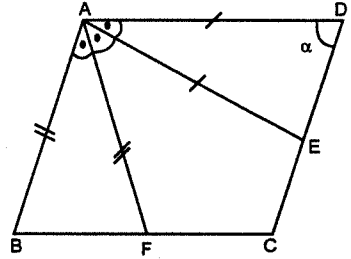
2.



$$\alpha = ?$$

Cevap: 90

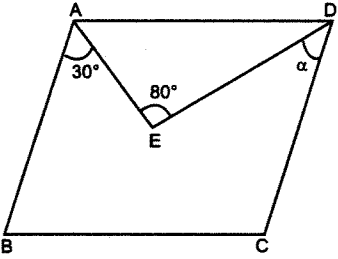
6.



$$\alpha = ?$$

Cevap: 72

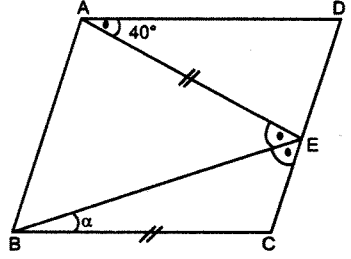
3.



$$\alpha = ?$$

Cevap: 50

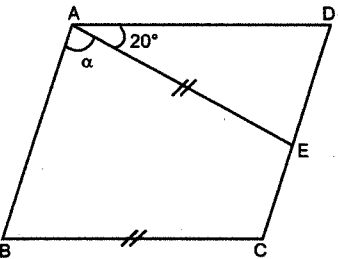
7.



$$\alpha = ?$$

Cevap: 15

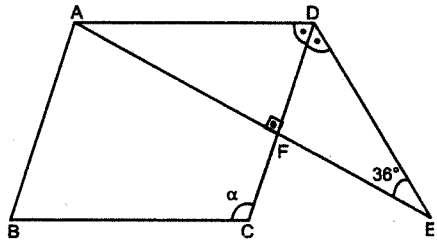
4.



$$\alpha = ?$$

Cevap: 80

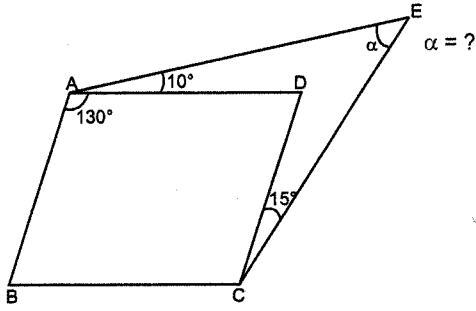
8.



$$\alpha = ?$$

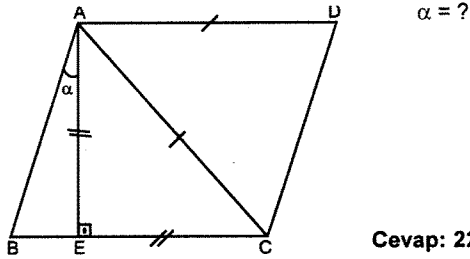
Cevap: 126

9.



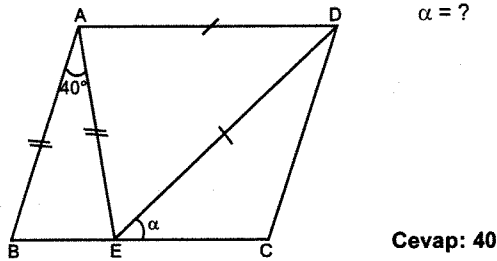
Cevap: 25

10.



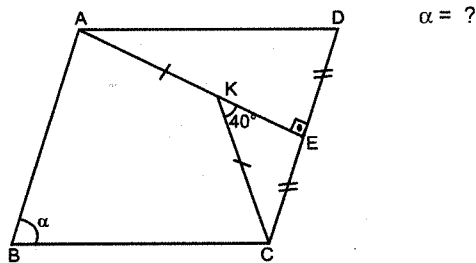
Cevap: 22,5

11.



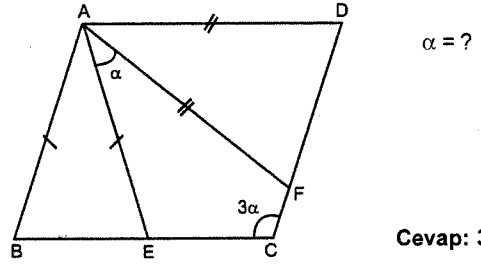
Cevap: 40

12.



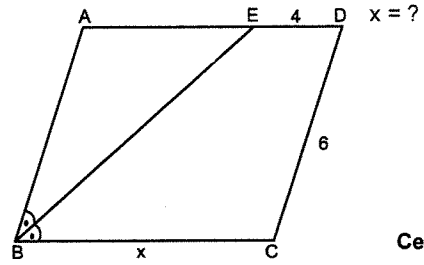
Cevap: 70

13.



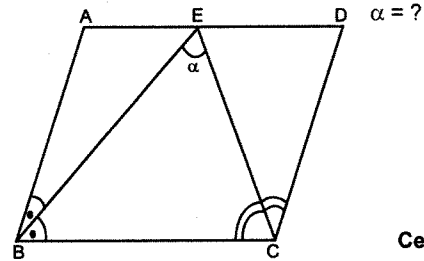
Cevap: 36

14.



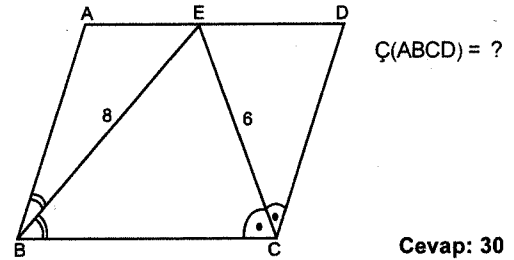
Cevap: 10

15.



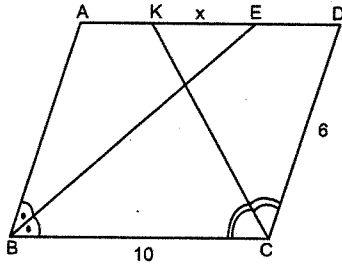
Cevap: 90

16.



Cevap: 30

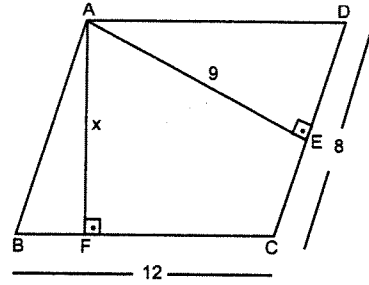
17.



$x = ?$

Cevap: 2

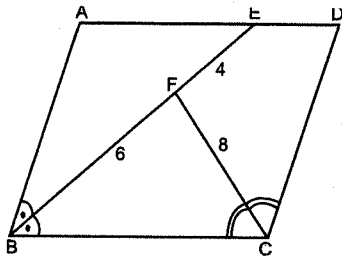
21.



$x = ?$

Cevap: 6

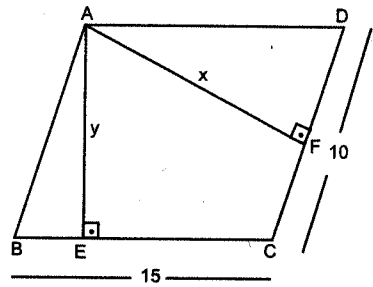
18.



$A(ABCD) = ?$

Cevap: 80

22.

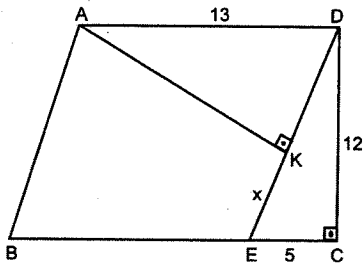


$x + y = 20$

$y = ?$

Cevap: 8

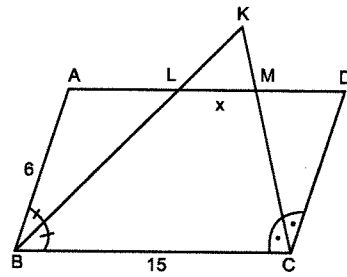
19.



$x = ?$

Cevap: 8

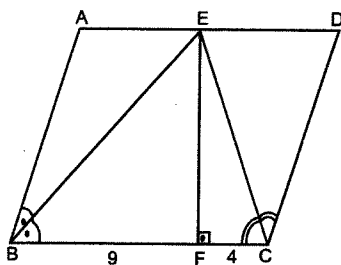
23.



$x = ?$

Cevap: 3

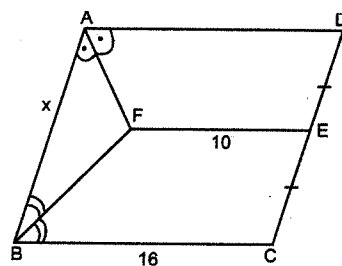
20.



$A(ABCD) = ?$

Cevap: 78

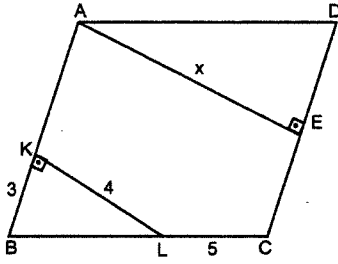
24.



$x = ?$

Cevap: 12

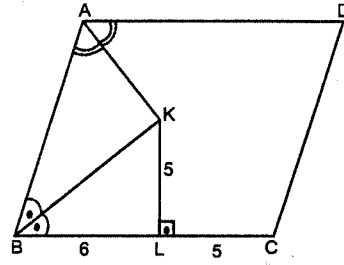
25.



$x = ?$

Cevap: 8

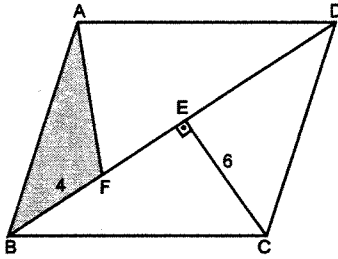
29.



$A(ABCD) = ?$

Cevap: 110

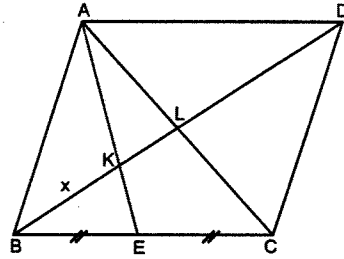
26.



$T.A = ?$

Cevap: 12

30.

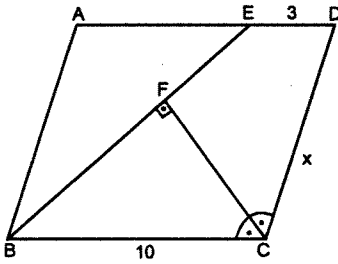


$|BD| = 18$

$x = ?$

Cevap: 6

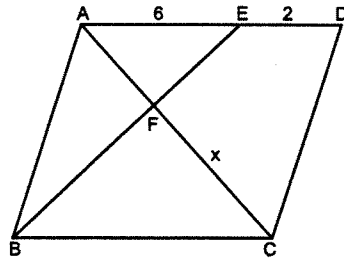
27.



$x = ?$

Cevap: 7

31.

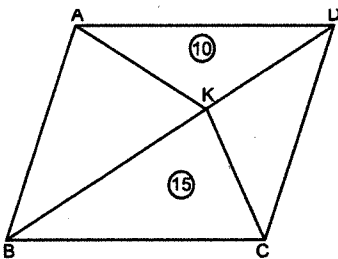


$|AC| = 14$

$x = ?$

Cevap: 8

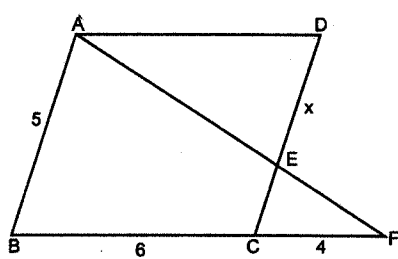
28.



$A(ABCD) = ?$

Cevap: 50

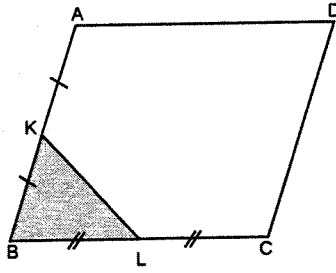
32.



$x = ?$

Cevap: 3

33.

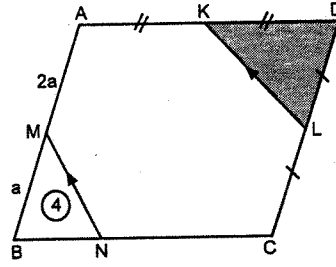


$$A(ABCD) = 80$$

$$T.A = ?$$

Cevap: 10

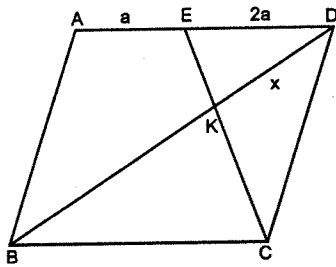
37.



$$T.A = ?$$

Cevap: 9

34.

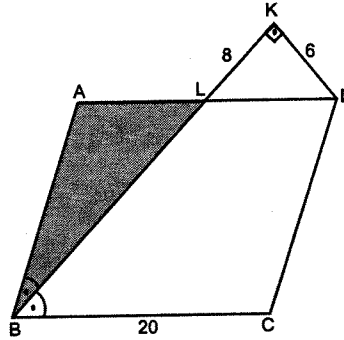


$$|BD| = 15$$

$$x = ?$$

Cevap: 6

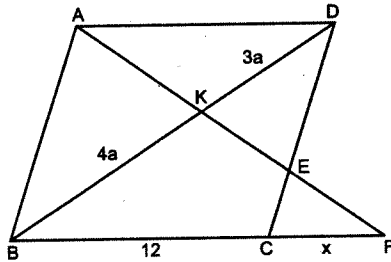
38.



$$T.A = ?$$

Cevap: 48

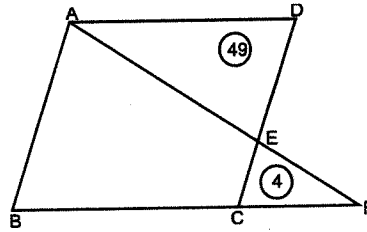
35.



$$x = ?$$

Cevap: 4

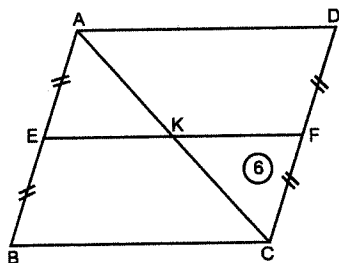
39.



$$A(ABCD) = ?$$

Cevap: 126

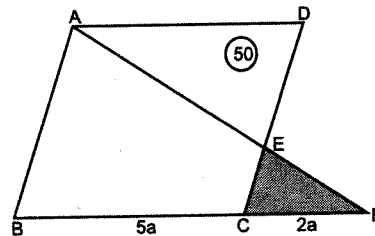
36.



$$A(ABCD) = ?$$

Cevap: 48

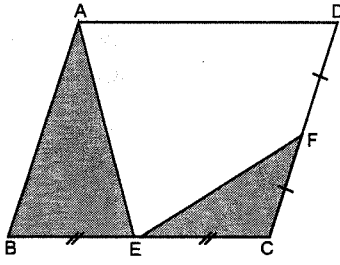
40.



$$T.A = ?$$

Cevap: 8

41.

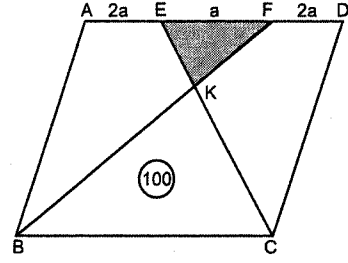


T.A = 24

$A(ABCD) = ?$

Cevap: 64

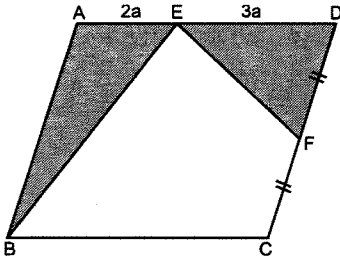
45.



T.A = ?

Cevap: 4

42.

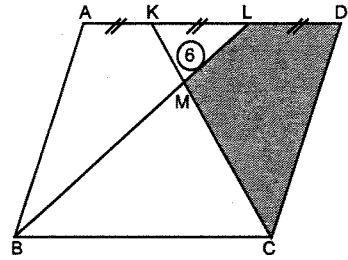


$A(ABCD) = 60$

T.A = ?

Cevap: 21

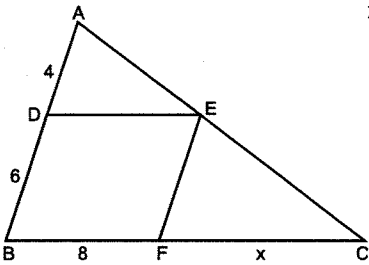
46.



T.A = ?

Cevap: 42

43.

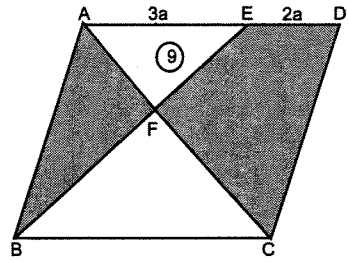


$x = ?$

DBFE
paralelkenar

Cevap: 12

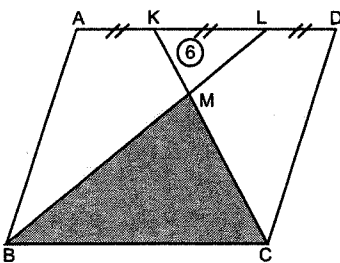
47.



T.A = ?

Cevap: 46

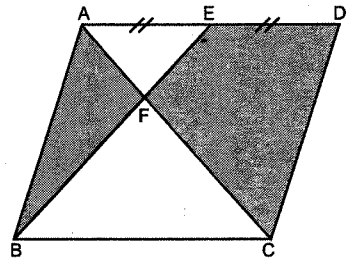
44.



T.A = ?

Cevap: 54

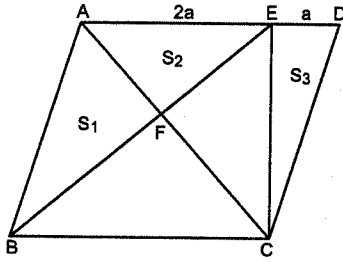
48.



$\frac{T.A}{A(ABCD)} = ?$

Cevap: $\frac{7}{12}$

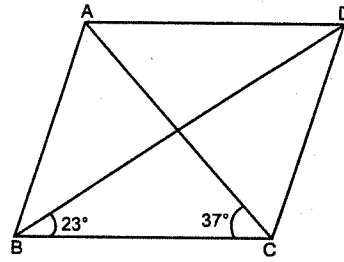
49.



$$\frac{S_1 + S_2}{S_3} = ?$$

Cevap: 2

53.



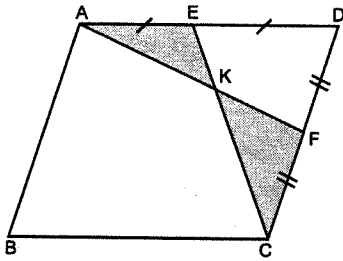
$$|BD| = 10$$

$$A(ABCD) = 20\sqrt{3}$$

$$|AC| = ?$$

Cevap: 8

50.

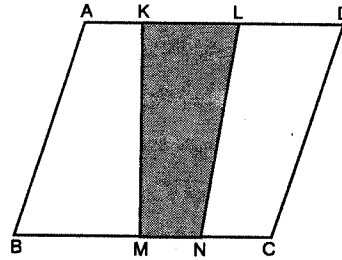


$$T.A = ?$$

$$A(ABCD) = 144$$

Cevap: 24

54.



$$|KL| = \frac{|AD|}{2}$$

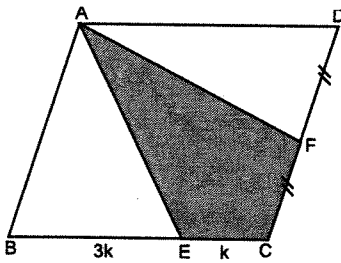
$$|MN| = \frac{|BC|}{3}$$

$$T.A = ?$$

$$A(ABCD) = 48$$

Cevap: 20

51.

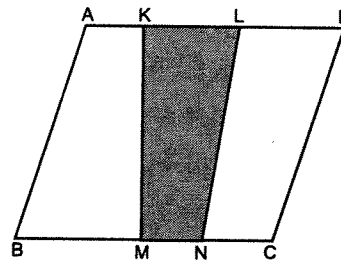


$$T.A = 12$$

$$A(ABCD) = ?$$

Cevap: 32

55.



$$3|KL| = |AD|$$

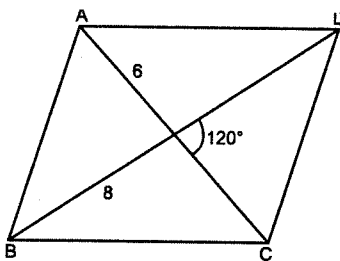
$$5|MN| = |BC|$$

$$A(ABCD) = 120$$

$$T.A = ?$$

Cevap: 32

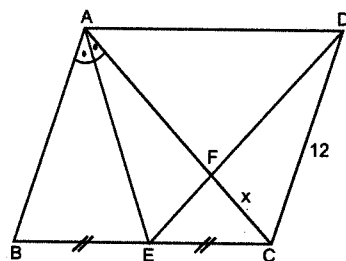
52.



$$A(ABCD) = ?$$

Cevap: $48\sqrt{3}$

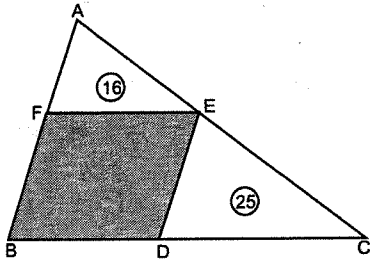
56.



$$x = ?$$

Cevap: 4

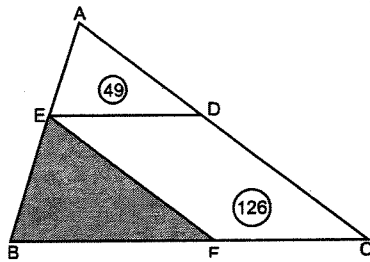
57.



T. A = ?
FBDE
paralelkenar

Cevap: 40

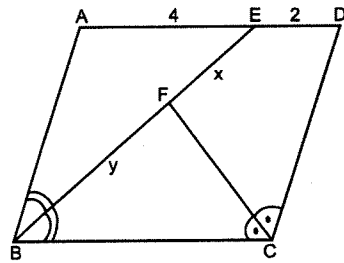
58.



T. A = ?
DEFC
paralelkenar

Cevap: 81

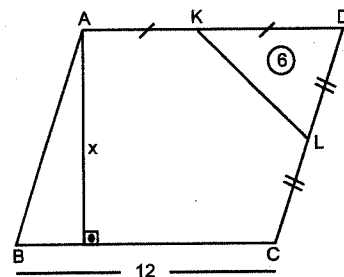
59.



$$\frac{x}{y} = ?$$

Cevap: $\frac{1}{3}$

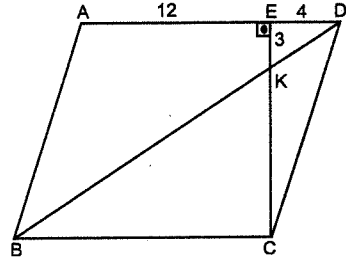
60.



$$x = ?$$

Cevap: 4

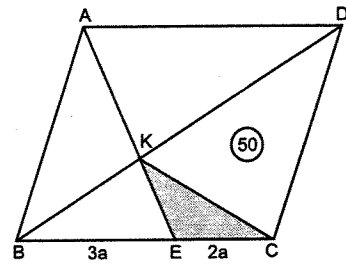
61.



$$A(ABCD) = ?$$

Cevap: 240

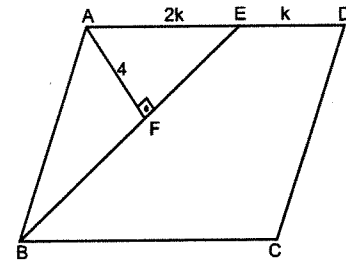
62.



$$\text{Taralı alan} = ?$$

Cevap: 12

63.

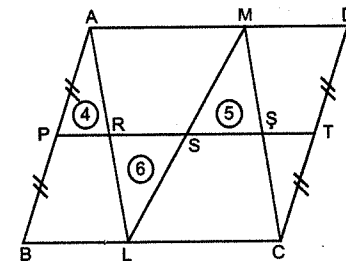


$$A(ABCD) = 36$$

$$|BE| = ?$$

Cevap: 6

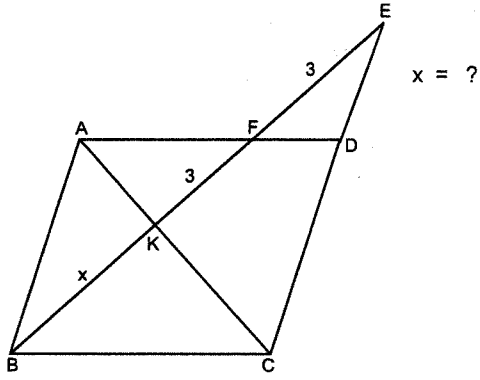
64.



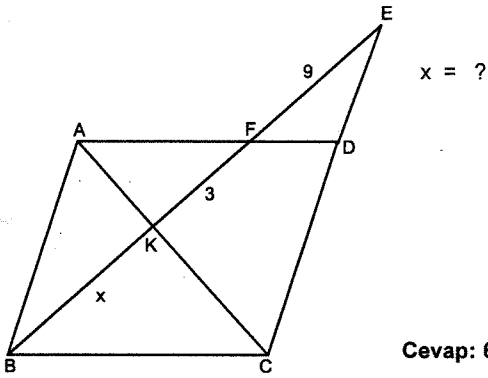
$$A(ABCD) = ?$$

Cevap: 72

65.

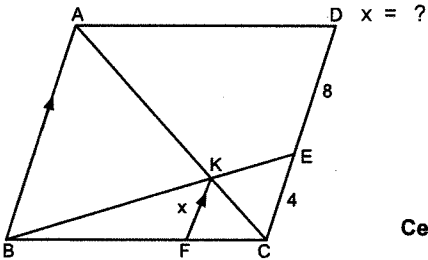
Cevap: $3\sqrt{2}$

66.



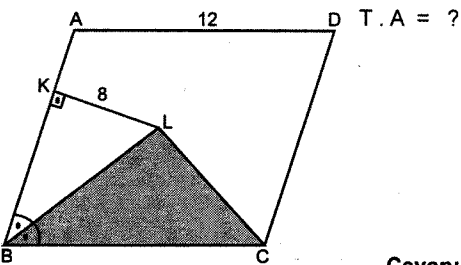
Cevap: 6

67.



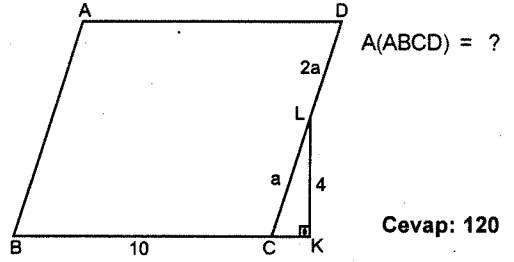
Cevap: 3

68.



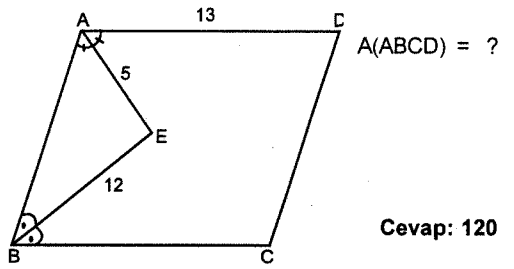
Cevap: 48

69.



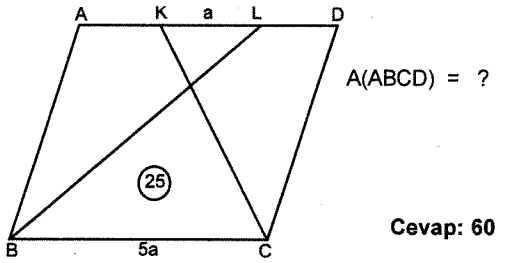
Cevap: 120

70.



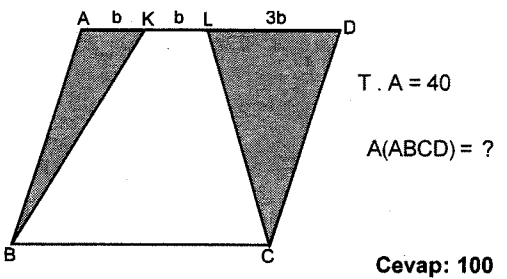
Cevap: 120

71.



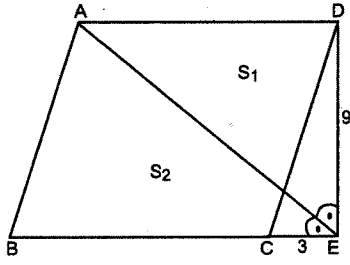
Cevap: 60

72.



Cevap: 100

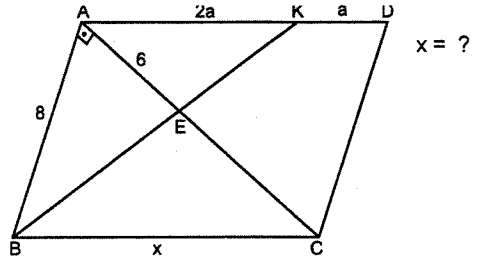
73.



$$\frac{S_1}{S_2} = ?$$

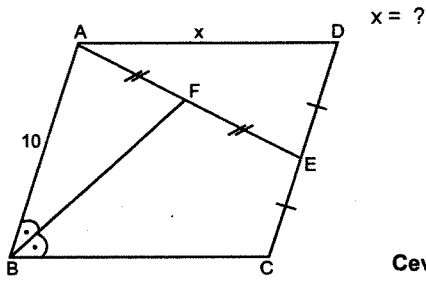
Cevap: $\frac{3}{5}$

77.



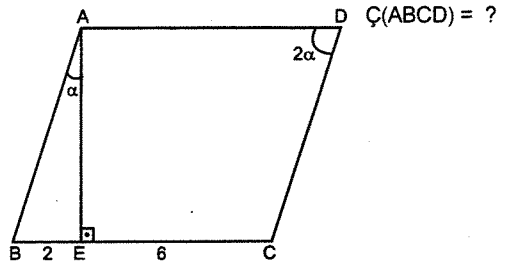
Cevap: 17

74.



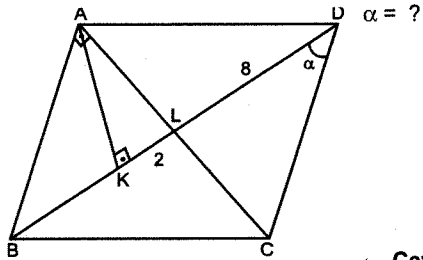
Cevap: 15

78.



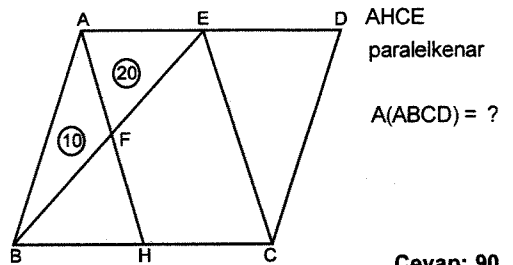
Cevap: 24

75.



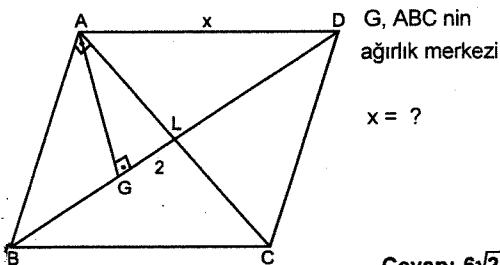
Cevap: 30

79.

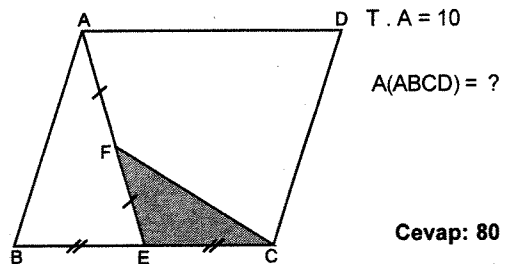


Cevap: 90

76.

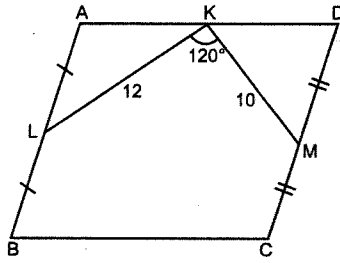
Cevap: $6\sqrt{2}$

80.



Cevap: 80

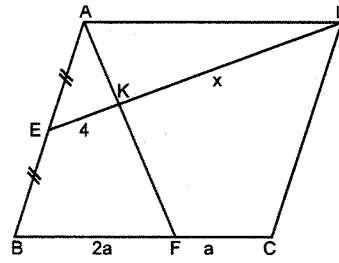
81.



$A(ABCD) = ?$

Cevap: $120\sqrt{3}$

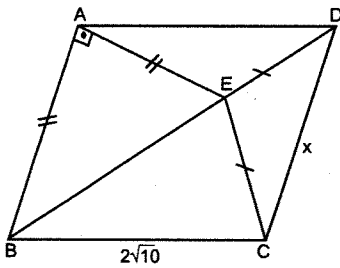
85.



$x = ?$

Cevap: 12

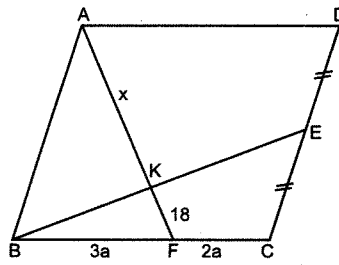
82.



$x = ?$

Cevap: 4

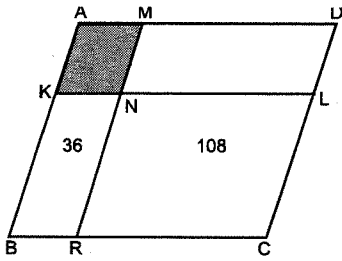
86.



$x = ?$

Cevap: 60

83.

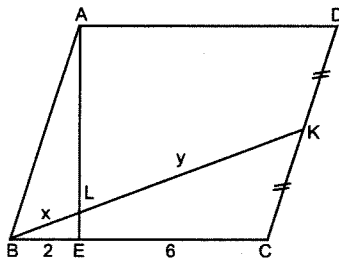


$A(ABCD) = 216$

$T.A = ?$

Cevap: 18

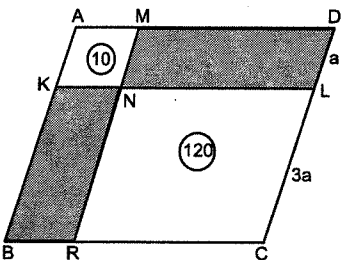
87.



$\frac{x}{y} = ?$

Cevap: $\frac{2}{7}$

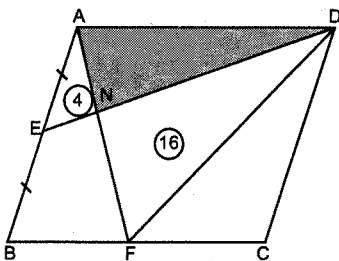
84.



$T.A = ?$

Cevap: 70

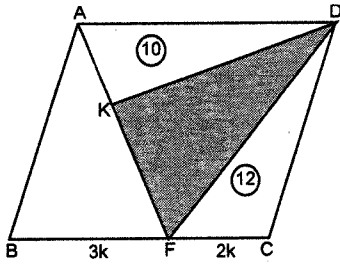
88.



$T.A = ?$

Cevap: 8

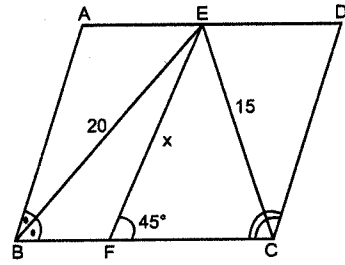
89.



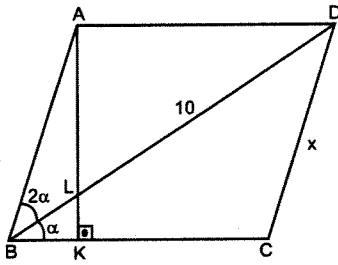
T.A = ?

Cevap: 20

93.

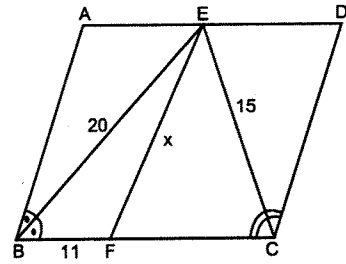
 $x = ?$ Cevap: $12\sqrt{2}$

90.

 $x = ?$

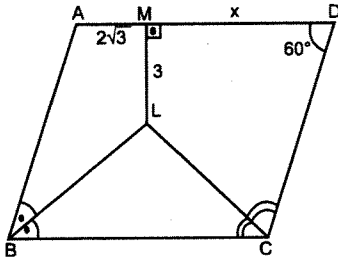
Cevap: 5

94.

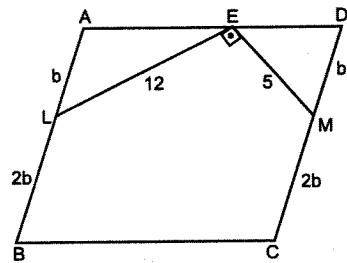
 $x = ?$

Cevap: 13

91.

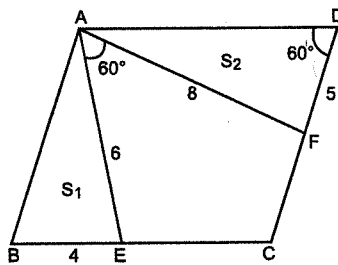
 $x = ?$ Cevap: $4\sqrt{3}$

95.

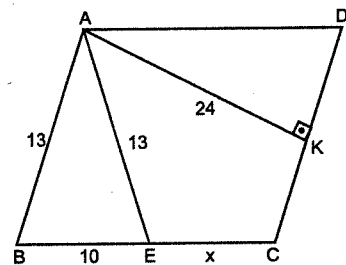
 $A(ABCD) = ?$

Cevap: 180

92.

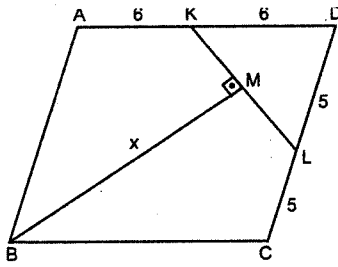
 $\frac{S_1}{S_2} = ?$ Cevap: $\frac{3}{5}$

96.

 $x = ?$

Cevap: 16

97.

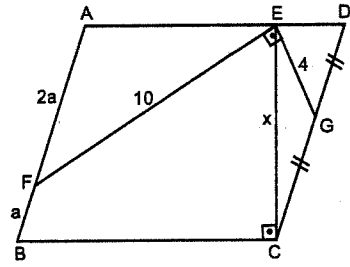


$$|KL| = 5$$

$$x = ?$$

Cevap: 14,4

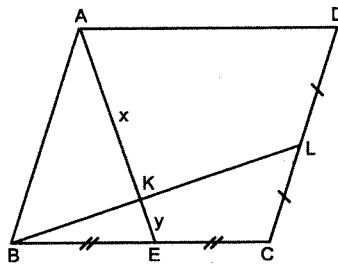
101.



$$x = ?$$

Cevap: $\frac{120}{17}$

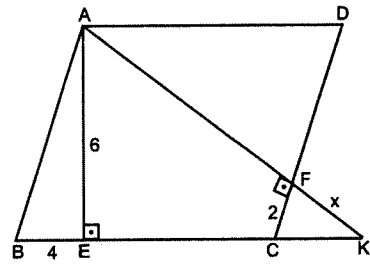
98.



$$\frac{x}{y} = ?$$

Cevap: 4

102.

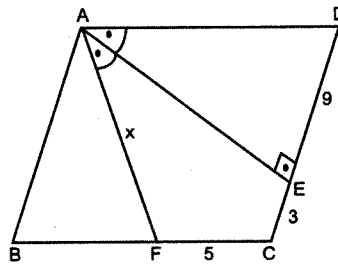


$$x = ?$$

Paralelkenar

Cevap: 3

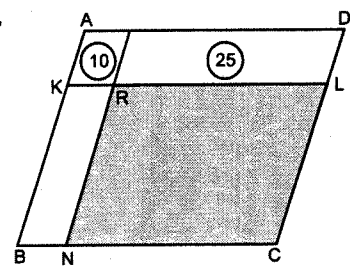
99.



$$x = ?$$

Cevap: 10

103.

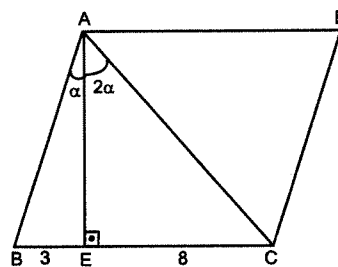


$$(ABCD) = 105$$

$$T.A = ?$$

Cevap: 50

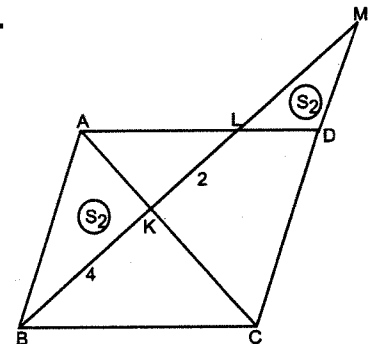
100.



$$A(ABCD) = ?$$

Cevap: 66

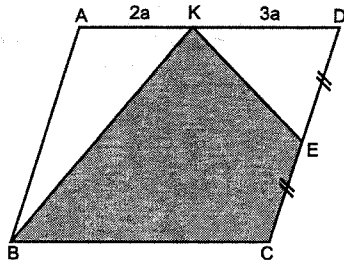
104.



$$\frac{S_1}{S_2} = ?$$

Cevap: $\frac{2}{3}$

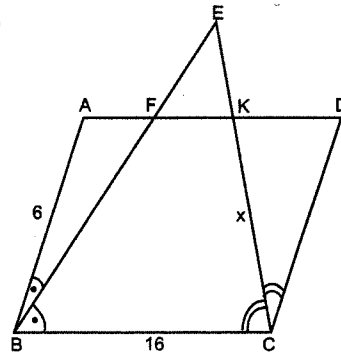
105.



$$\frac{T.A}{A(ABCD)} = ?$$

$$\text{Cevap: } \frac{13}{20}$$

108.

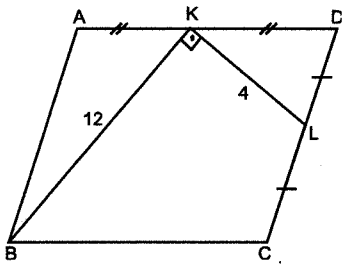


$$|EC| = 12$$

$$x = ?$$

$$\text{Cevap: } 9$$

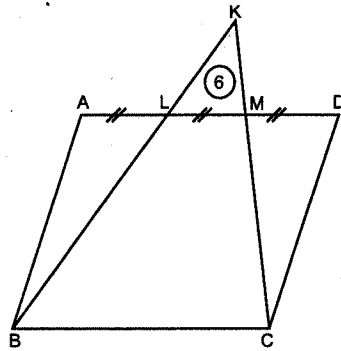
106.



$$A(ABCD) = ?$$

$$\text{Cevap: } 64$$

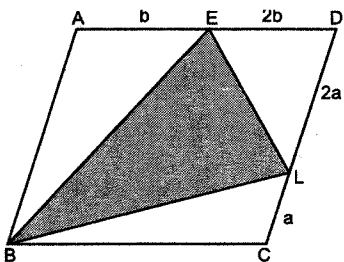
109.



$$A(ABCD) = ?$$

$$\text{Cevap: } 72$$

107.

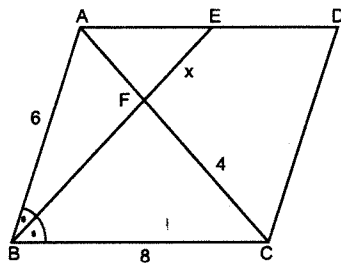


$$T.A = 24$$

$$A(ABCD) = ?$$

$$\text{Cevap: } 54$$

110.

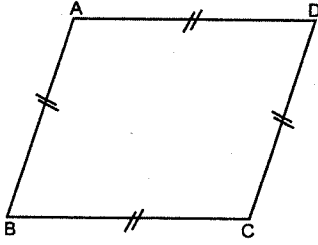


$$x = ?$$

$$\text{Cevap: } \frac{9}{2}$$

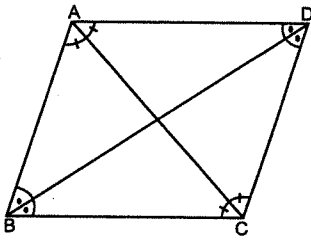
EŞKENAR DÖRTGEN

*



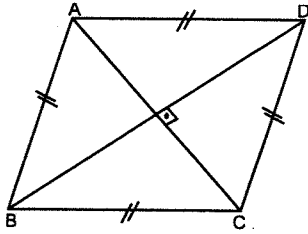
Tüm kenarları eşittir ve paralelkenara ait tüm özellikleri taşır.

*



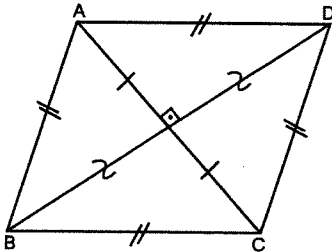
Köşegenler açı-ortaydır.

*



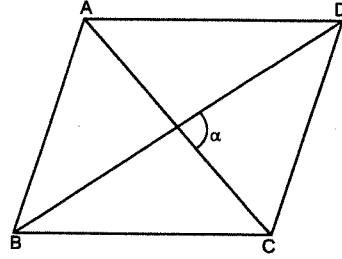
Köşegenler dik kesişir.

*



$$\text{Alan}(ABCD) = \frac{|AC| \cdot |BD|}{2}$$

1.

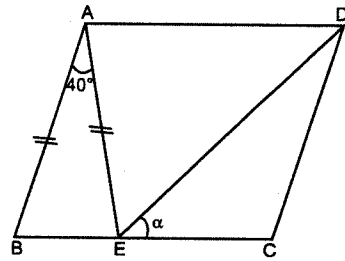


ABCD eşkenar dörtgen

$$\alpha = ?$$

Cevap: 90

2.

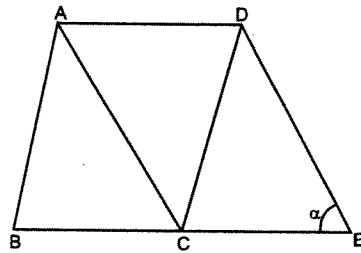


ABCD eşkenar dörtgen

$$\alpha = ?$$

Cevap: 55

3.

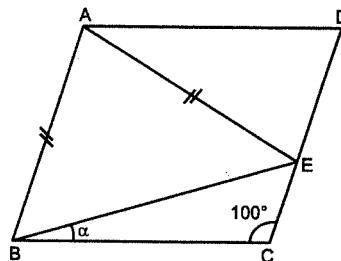


ABCD ve ACED eşkenar dörtgen

$$\alpha = ?$$

Cevap: 60°

4.

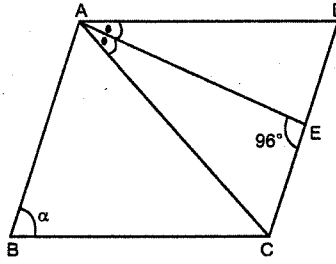


ABCD eşkenar dörtgen,

$$\alpha = ?$$

Cevap: 30

5.

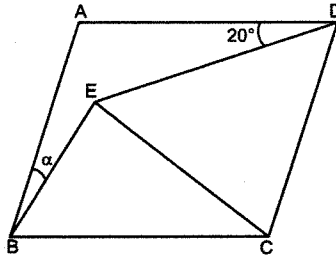


ABCD
eşkenar
dörtgen,

$$\alpha = ?$$

Cevap: 68

6.

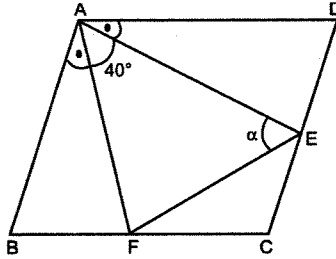


ABCD
eşkenar
dörtgen,
DEC
eşkenar
üçgen

$$\alpha = ?$$

Cevap: 10

7.

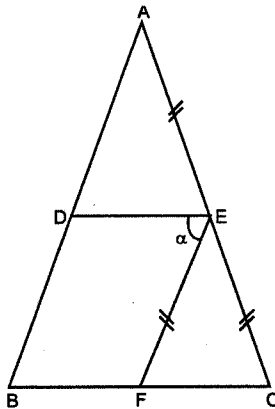


ABCD
eşkenar
dörtgen,

$$\alpha = ?$$

Cevap: 70

8.

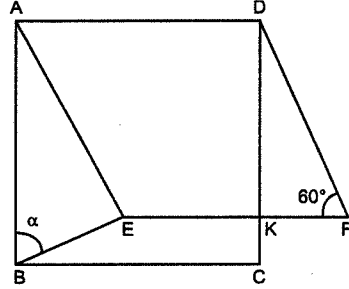


BDEF eşkenar
dörtgen,

$$\alpha = ?$$

Cevap: 60

9.

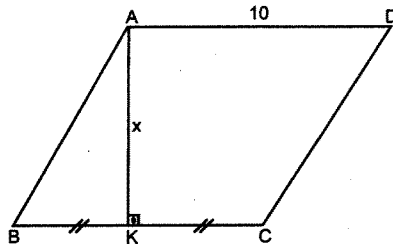


ABCD kare,
AEFD
eşkenar
dörtgen

$$\alpha = ?$$

Cevap: 75

10.

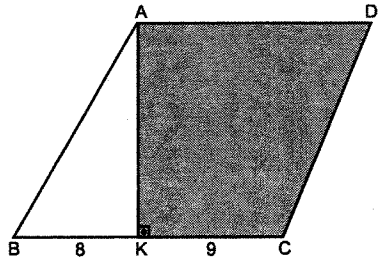


$$x = ?$$

Eşkenar
dörtgen

Cevap: $5\sqrt{3}$

11.

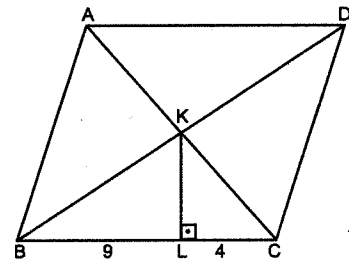


$$T.A = ?$$

Eşkenar
dörtgen

Cevap: 195

12.

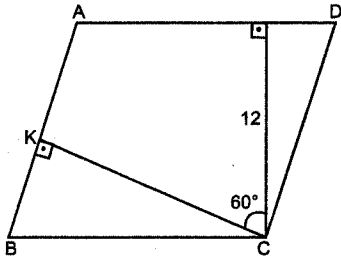


$$A(ABCD) = ?$$

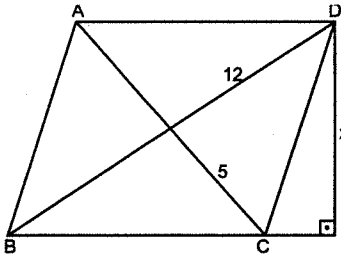
Eşkenar dört-
gen

Cevap: 156

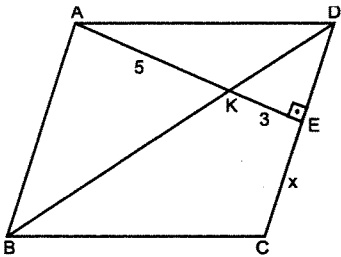
13.

 $A(ABCD) = ?$ Eşkenar
dörtgenCevap: $96\sqrt{3}$

14.

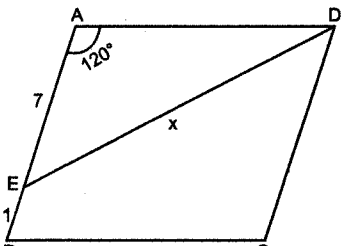
 $x = ?$ Eşkenar
dörtgenCevap: $\frac{120}{13}$

15.

 $x = ?$ Eşkenar
dörtgen

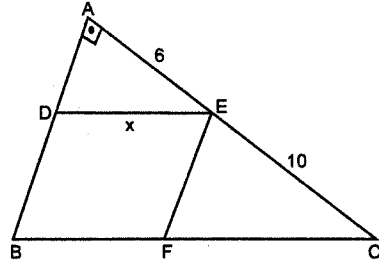
Cevap: 4

16.

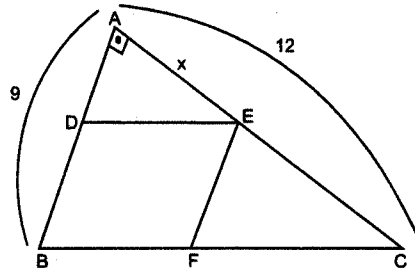
 $x = ?$ Eşkenar
dörtgen

Cevap: 13

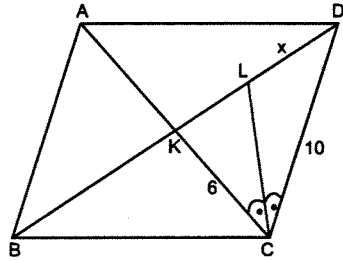
17.

 $x = ?$ BDEF
Eşkenar
dörtgenCevap: $\frac{15}{2}$

18.

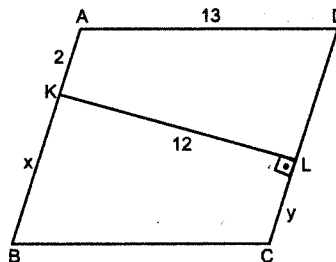
 $x = ?$ BDEF
eşkenar
dörtgenCevap: $\frac{9}{2}$

19.

Eşkenar
dörtgen $x = ?$

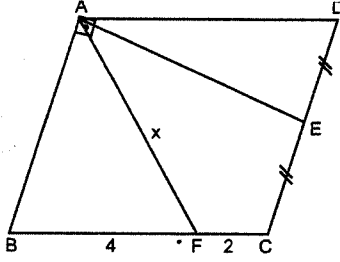
Cevap: 5

20.

Eşkenar
dörtgen $x - y = ?$

Cevap: 5

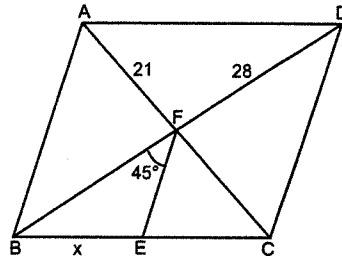
21.

Eşkenar
dörtgen

$x = ?$

Cevap: $2\sqrt{7}$

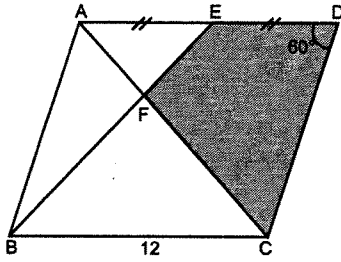
25.

Eşkenar
dörtgen

$x = ?$

Cevap: 20

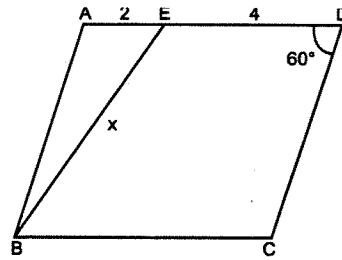
22.



T. A = ?

Eşkenar
dörtgen?Cevap: $30\sqrt{3}$

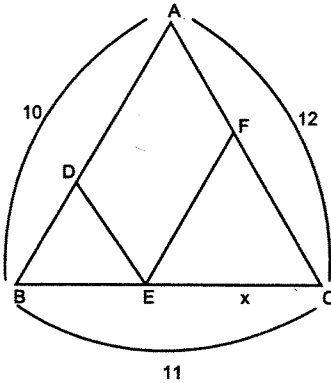
26.

Eşkenar
dörtgen

$x = ?$

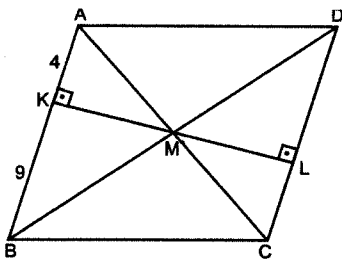
Cevap: $2\sqrt{13}$

23.

ADEF
eşkenar
dörtgen
 $x = ?$

Cevap: 6

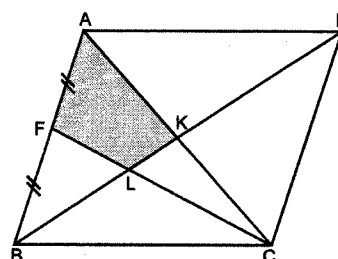
24.

Eşkenar
dörtgen

$|KL| = ?$

Cevap: 12

27.

Eşkenar
dörtgen

$|BD| = 18$

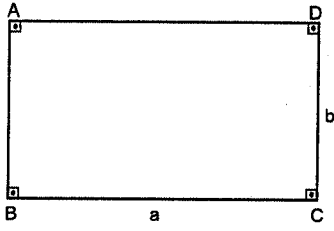
$|AC| = 12$

T. A = ?

Cevap: 18

DİKDÖRTGEN

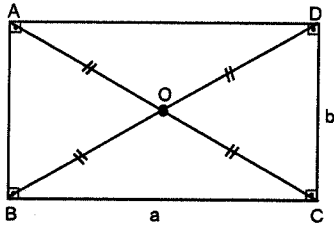
*



$$\text{Alan}(ABCD) = a \cdot b$$

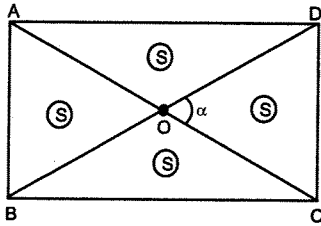
$$\text{Çevre}(ABCD) = 2a + 2b$$

*



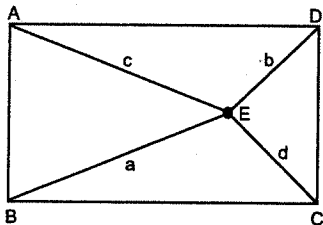
- Dikdörtgende köşegen uzunlukları birbirine eşittir.
 $|AC| = |BD|$
- O, noktası Dikdörtgenin ağırlık merkezidir.
- Köşegenlerden biri verildiği zaman, diğer köşegeni çizerseniz yukarıdaki gibi köşegenlerin birbirini ortaladığını mutlaka göstermelisiniz.

*



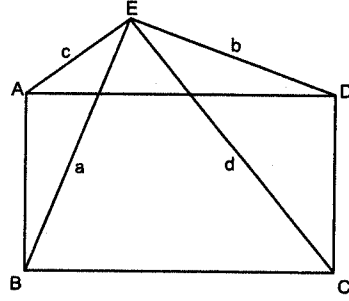
$$\text{Alan}(ABCD) = \frac{|AC| \cdot |BD| \cdot \sin \alpha}{2}$$

*



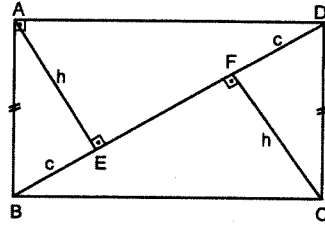
$$(a^2 + b^2 = c^2 + d^2)$$

*

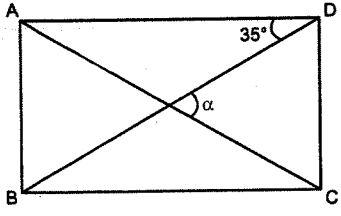


$$(a^2 + b^2 = c^2 + d^2)$$

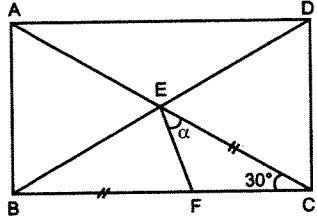
*



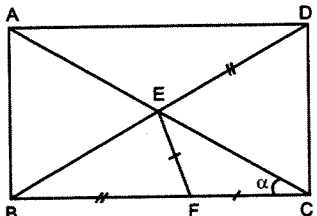
- A ve C köşelerinden köşegene indirilen dikmeler birbirine eşittir. $|EB| = |FD|$ ve $|AE| = |FC|$
- Ayrıca şekil içinde öklid bağıntısına dikkat edin.
- Paralelkenara ait bütün özellikler dikdörtgen içinde geçerlidir.
- Bu kuralların olmadığı yerlerde dikmeler ikiden fazla ise orada $(\alpha, \theta, 90)$ benzerliği vardır. Yani herhangi bir açiya α , sonra θ yazın. Kenarlarada dikkat ederek benzer üçgen, eş üçgen bulmaya çalışın.
- Kelebek benzerliğine dikkat edin.
- Normal alan formülünden çıkmayan sorularda köşegen çizip, köşegenler arasında çıkan α açısı (30, 45, 60 veya bunların bütünleyeni ise) köşegenler çarpımının yarısı çarpı aradaki açının sinüsü ile bu alanı bulabilirsiniz.

1.  $\alpha = ?$

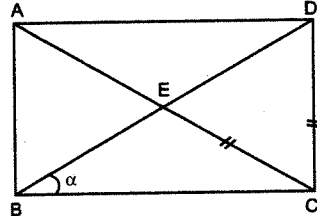
Cevap: 70

2.  $\alpha = ?$

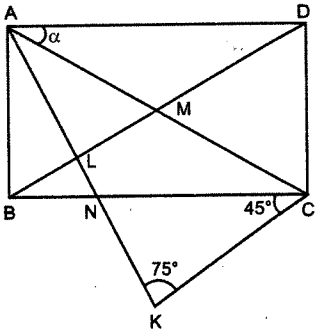
Cevap: 45

3.  $\alpha = ?$

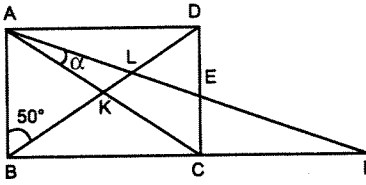
Cevap: 36

4.  $\alpha = ?$

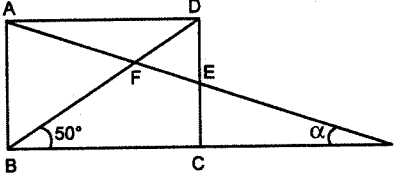
Cevap: 30

5.  $|AK| = |BD|$
 $\alpha = ?$

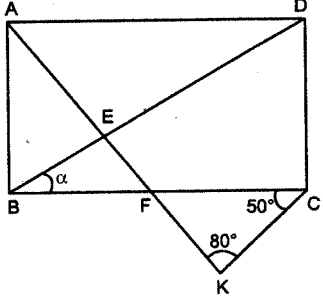
Cevap: 30

6.  $|BD| = |CF|$
 $\alpha = ?$

Cevap: 20°

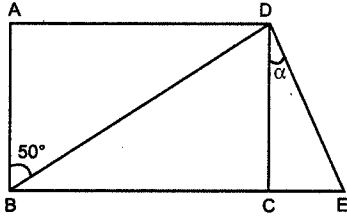
7.  $|BD| = |CK|$
 $\alpha = ?$

Cevap: 25

8.  $|BD| = |AK|$
 $\alpha = ?$

Cevap: 30°

9.

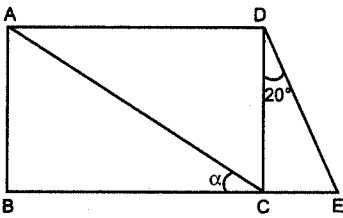


$$|BE| = |BD|$$

$$\alpha = ?$$

Cevap: 20

10.

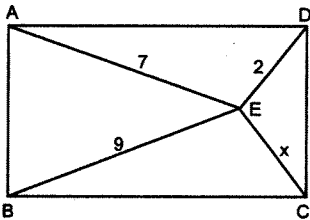


$$|AC| = |BE|$$

$$\alpha = ?$$

Cevap: 40

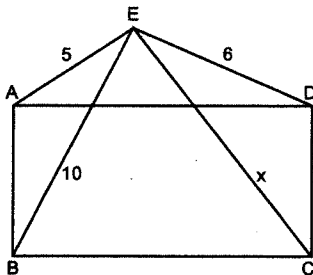
11.



$$x = ?$$

Cevap: 6

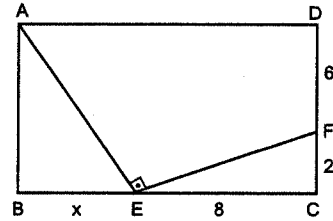
12.



$$|EC| = x = ?$$

Cevap: $\sqrt{111}$

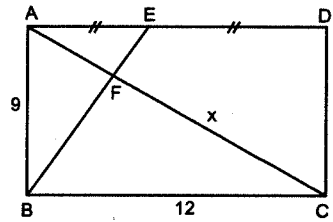
13.



$$x = ?$$

Cevap: 2

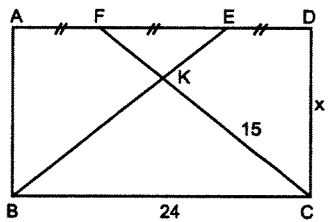
14.



$$x = ?$$

Cevap: 10

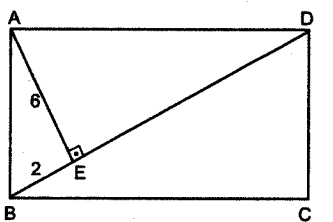
15.



$$x = ?$$

Cevap: 12

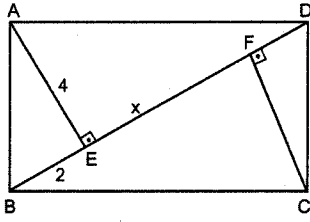
16.



$$A(ABCD) = ?$$

Cevap: 120

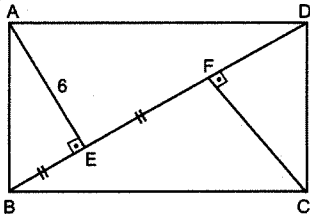
17.



$x = ?$

Cevap: 6

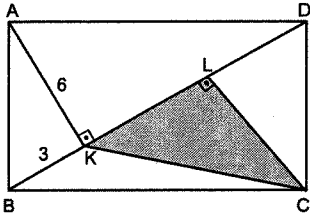
18.



$|BD| = ?$

Cevap: $9\sqrt{2}$

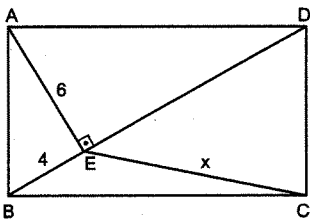
19.



$T.A = ?$

Cevap: 27

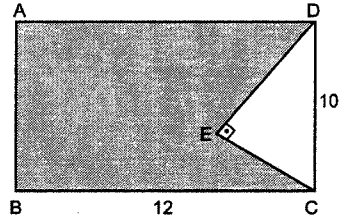
20.



$x = ?$

Cevap: $\sqrt{61}$

21.

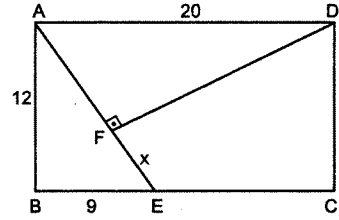


$\angle DEC = 24$

$T.A = ?$

Cevap: 96

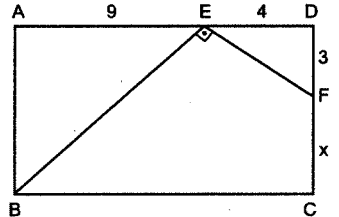
22.



$x = ?$

Cevap: 3

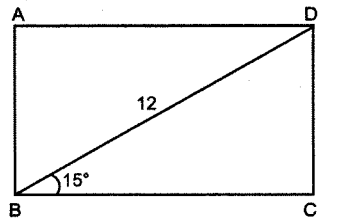
23.



$x = ?$

Cevap: 9

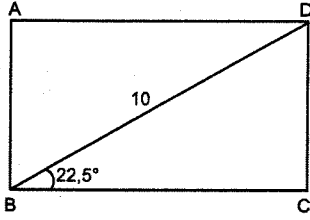
24.



$A(ABCD) = ?$

Cevap: 36

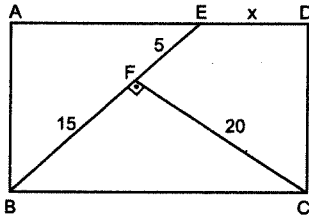
25.



$$A(ABCD) = ?$$

$$\text{Cevap: } 25\sqrt{2}$$

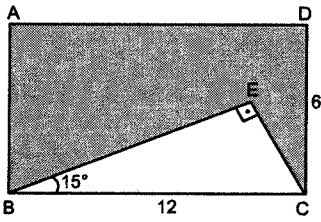
26.



$$x = ?$$

$$\text{Cevap: } 13$$

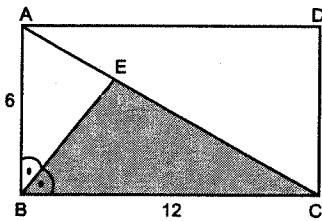
27.



$$T.A = ?$$

$$\text{Cevap: } 54$$

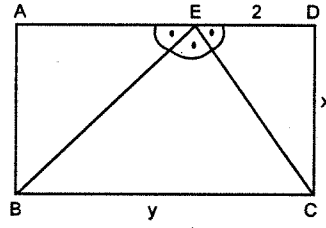
28.



$$T.A = ?$$

$$\text{Cevap: } 24$$

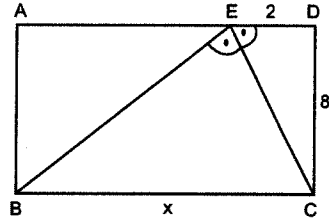
29.



$$x.y = ?$$

$$\text{Cevap: } 8\sqrt{3}$$

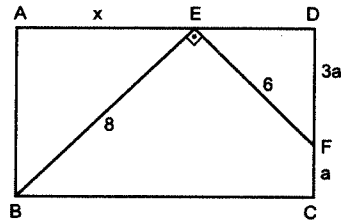
30.



$$x = ?$$

$$\text{Cevap: } 17$$

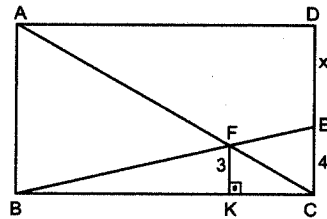
31.



$$x = ?$$

$$\text{Cevap: } 4\sqrt{2}$$

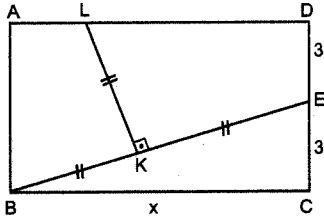
32.



$$x = ?$$

$$\text{Cevap: } 8$$

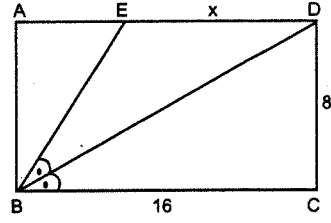
33.



$x = ?$

Cevap: 9

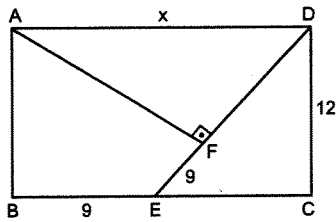
37.



$x = ?$

Cevap: 10

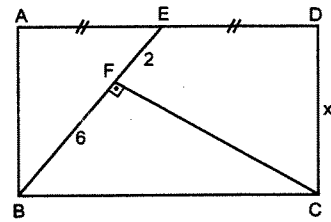
34.



$x = ?$

Cevap: $\frac{25}{2}$

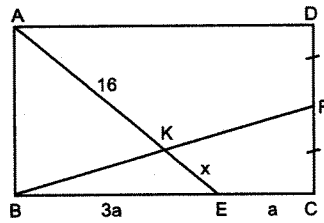
38.



$x = ?$

Cevap: $2\sqrt{10}$

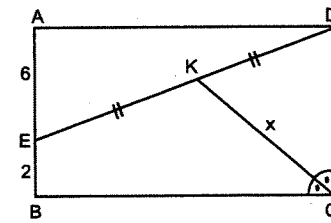
35.



$x = ?$

Cevap: 6

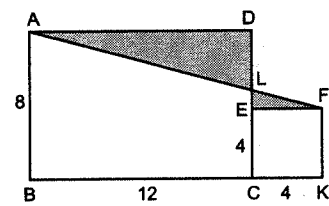
39.



$x = ?$

Cevap: $5\sqrt{2}$

36.

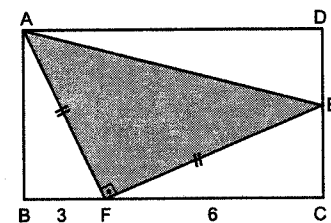


ECKF kare

$T.A = ?$

Cevap: 20

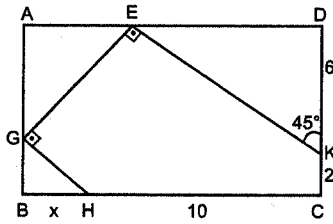
40.



$T.A = ?$

Cevap: $\frac{45}{2}$

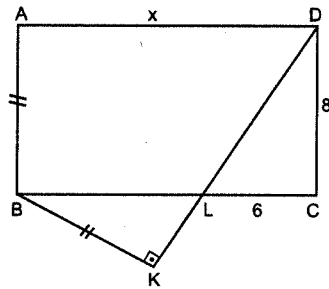
41.



$x = ?$

Cevap: 2

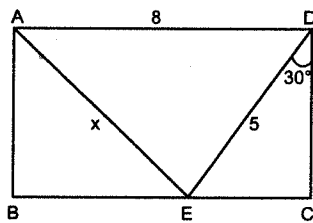
45.



x = ?

Cevap: 16

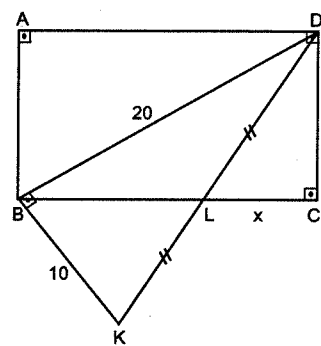
42



$x = ?$

Cevap: 7

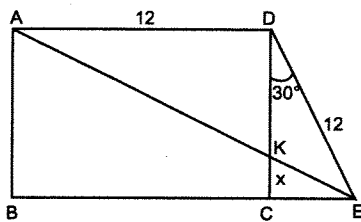
46.



$x = ?$

Cevap: $3\sqrt{5}$

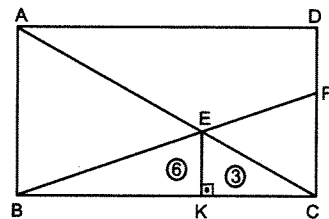
43.



$x = ?$

Cevap: $2\sqrt{3}$

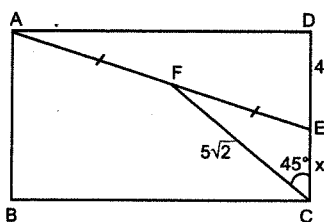
47.



A(ABCD) = ?

Cevap: 54

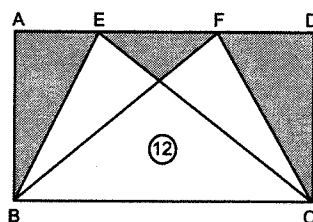
44.



x = ?

Cevap: 3

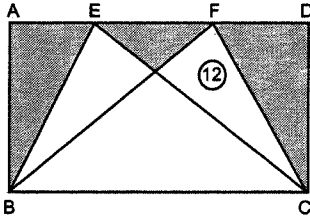
48.



T.A = ?

Cevap: 12

49.

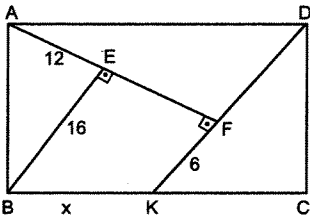


$$A(ABCD) = 144$$

$$T.A = ?$$

Cevap: 60

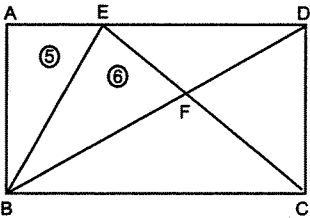
50.



$$x = ?$$

$$\text{Cevap: } \frac{50}{3}$$

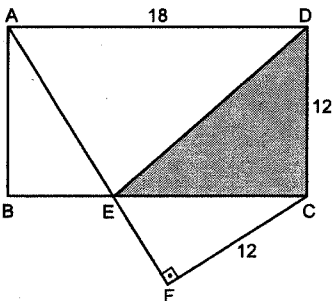
51.



$$A(ABCD) = ?$$

Cevap: 30

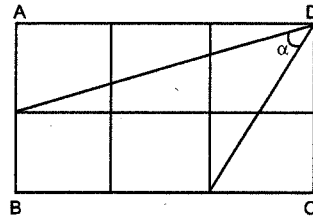
52.



$$T.A = ?$$

Cevap: 78

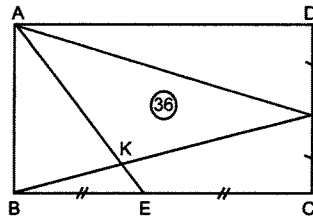
53.



$$\alpha = ?$$

Cevap: 45

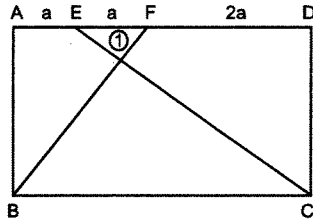
54.



$$A(ABCD) = ?$$

Cevap: 120

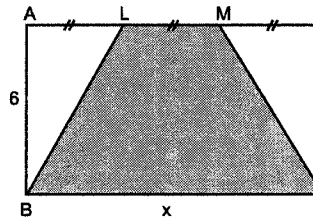
55.



$$A(ABCD) = ?$$

Cevap: 40

56.

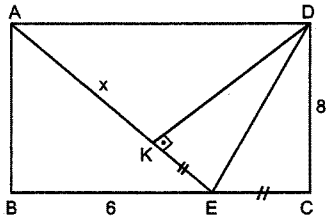


$$A(BCML) = 40$$

$$x = ?$$

Cevap: 10

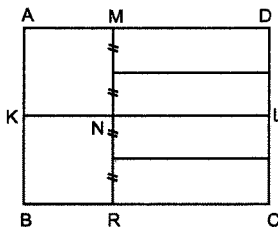
57.



$x = ?$

Cevap: 6

58.



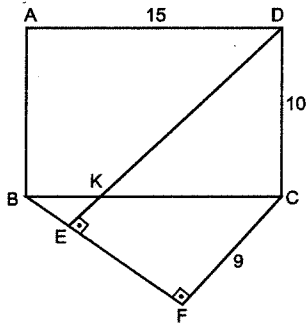
Şekildeki dikdörtgen ve karelerin çevreleri eşit olup

$A(ABCD) = 80$

$\mathcal{C}(ABCD) = ?$

Cevap: 36

59.

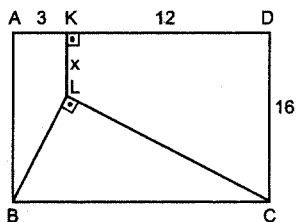


ABCD
dikdörtgen

$|ED| = ?$

Cevap: 17

60.

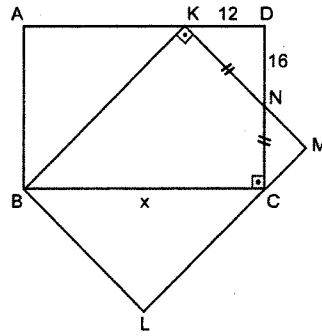


ABCD
dikdörtgen

$x = ?$

Cevap: 10

61.

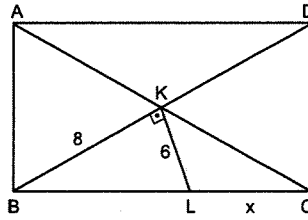


ABCD ve BKML
dikdörtgen

$x = ?$

Cevap: 60

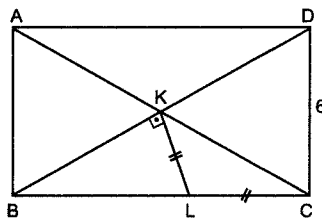
62.



$x = ?$

Cevap: 2,8

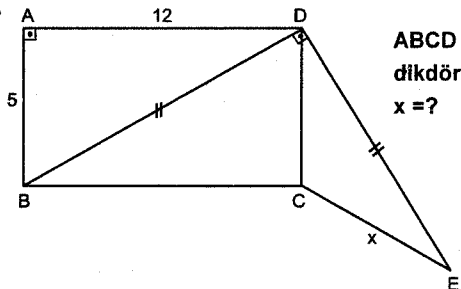
63.



Alan(ABCD)=?

Cevap: $36\sqrt{3}$

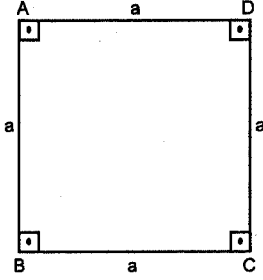
64.



ABCD
dikdörtgen
 $x = ?$

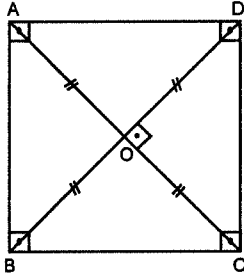
Cevap: $\sqrt{74}$

KARE



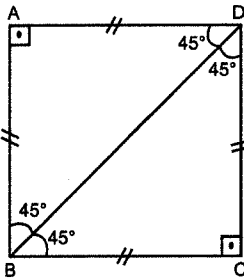
$$\text{Alan}(ABCD) = a^2$$

$$\text{Çevre}(ABCD) = 4a$$



Köşegenlerin kesim noktası **ağırlık merkezidir**.

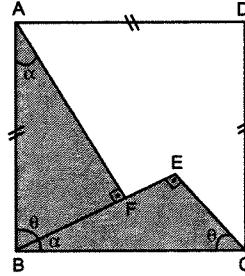
Köşegenler birbirini ortalar birbirine eşit ve dik kesirler.



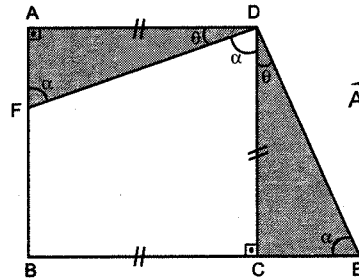
Kare sorularında köşegenlerden biri verilirse orada ikizkenar dik üçgen vardır. 45° leri mutlaka şekilde gösterin. Yazabildiğiniz kadar $45^\circ - 45^\circ - 90^\circ$ yazın.

Soruların bir çoğunda köşegenlerden biri verildiğinde diğerini kendimiz çizip köşegenlerin kesiştiği yerde 90° olduğunu gösterdiğimiz zaman özel üçgenler çıkıyor. Buradan soruyu rahat bir şekilde çözebiliriz.

- Yukarıdaki gibi soru çıkmıyorsa benzerliği deneyin.
- 90° 'lerin çok olduğu yerde açılara isim takın (α, θ) gibi... sonra böyle çözmeye çalışın. Buradanda çıkmıyorsa Öklid bağıntısına dikkat edin. Ne bileyim Kelebek benzerliğine bakın. Ama mutlaka şekille oynayın.
- Alan sorularında S'leme (okunuşu esleme) yapın. Benzer iki üçgenin alanları oranı, benzerlik oranının karesine eşittir. Kuralını yapmaya çalışın.
- Karenin tüm kenarlarının eşit olduğunu gösterin ve karenin bir kenarını görecektir şekilde bir çizgi uzatıp eş üçgenlerden soruyu çözün.



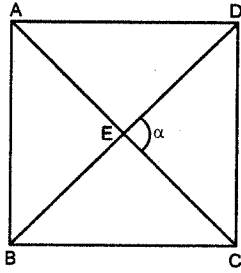
$$\triangle ABF \cong \triangle BCE$$



$$\triangle AFD \cong \triangle CED$$

gibi

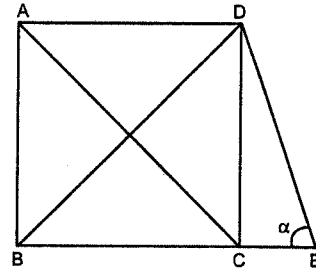
1.



$$\alpha = ?$$

Cevap: 90

5.

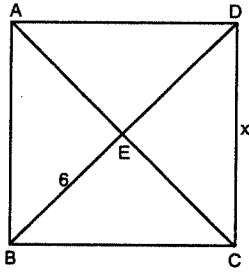


$$|AC| = |BE|$$

$$\alpha = ?$$

Cevap: 67,5

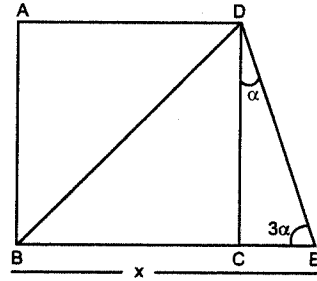
2.



$$x = ?$$

Cevap: $6\sqrt{2}$

6.

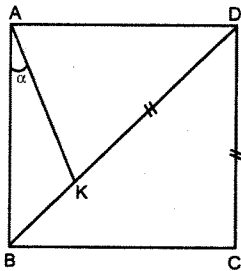


$$A(ABCD) = 64$$

$$x = ?$$

Cevap: $8\sqrt{2}$

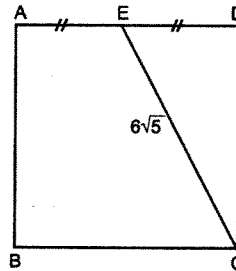
3.



$$\alpha = ?$$

Cevap: 22,5

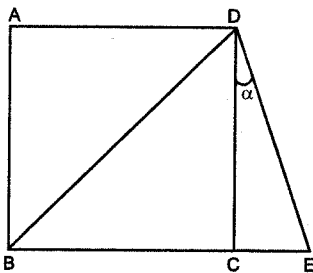
7.



$$A(ABCD) = ?$$

Cevap: 144

4.

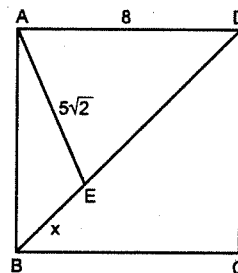


$$|BD| = |BE|$$

$$\alpha = ?$$

Cevap: 22,5

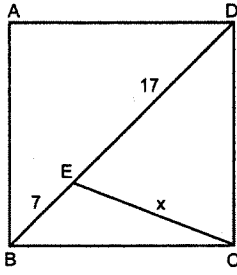
8.



$$x = ?$$

Cevap: $\sqrt{2}$

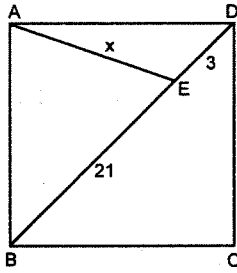
9.



$x = ?$

Cevap: 13

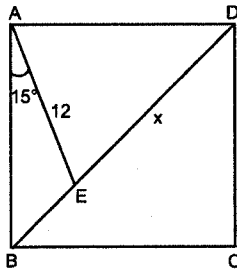
10.



$x = ?$

Cevap: 15

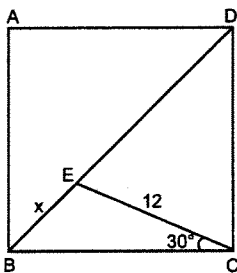
11.



$x = ?$

Cevap: $6\sqrt{3} + 6$

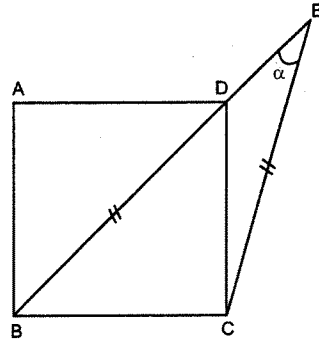
12.



$x = ?$

Cevap: $6\sqrt{2}$

13.

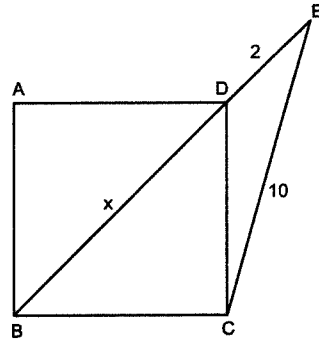


$|BD| = |EC|$

$\alpha = ?$

Cevap: 30

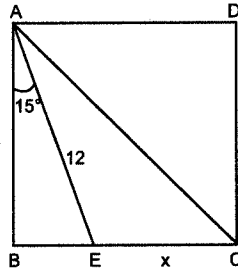
14.



$x = ?$

Cevap: 12

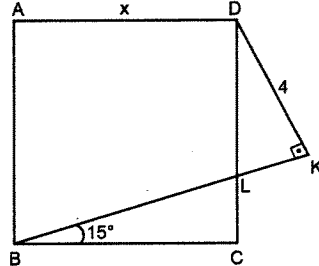
15.



$x = ?$

Cevap: $6\sqrt{2}$

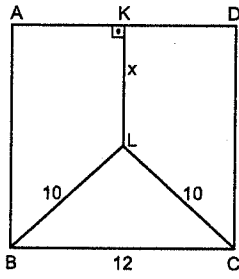
16.



$x = ?$

Cevap: $4\sqrt{2}$

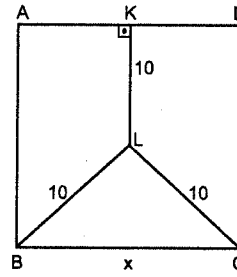
17.



$x = ?$

Cevap: 4

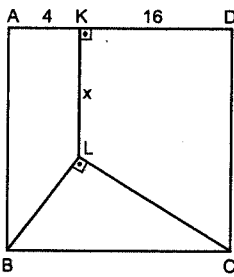
21.



$x = ?$

Cevap: 16

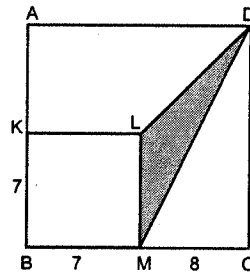
18.



$x = ?$

Cevap: 12

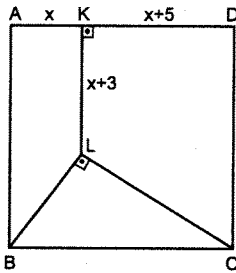
22.



$T.A = ?$

Cevap: 28

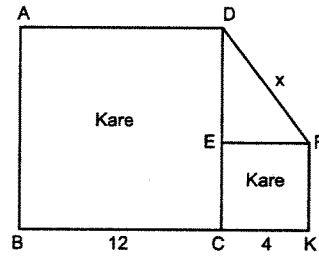
19.



$x = ?$

Cevap: 4

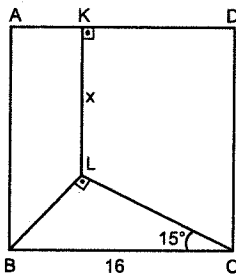
23.



$x = ?$

Cevap: $4\sqrt{5}$

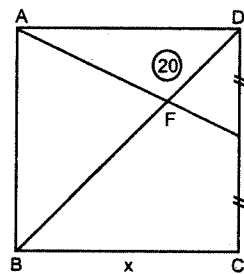
20.



$x = ?$

Cevap: 12

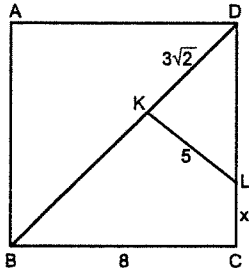
24.



$x = ?$

Cevap: $2\sqrt{30}$

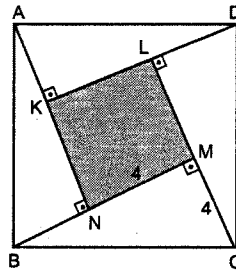
25.



$$x = ?$$

Cevap: 1

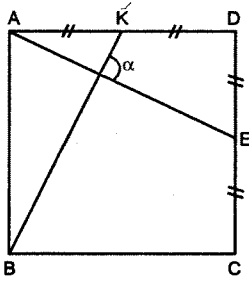
29.



$$T.A = ?$$

Cevap: 16

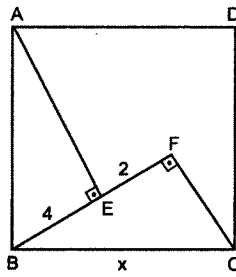
26.



$$\alpha = ?$$

Cevap: 90

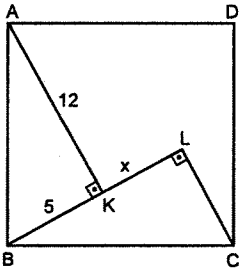
30.



$$x = ?$$

Cevap: $2\sqrt{13}$

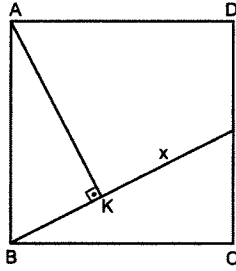
27.



$$x = ?$$

Cevap: 7

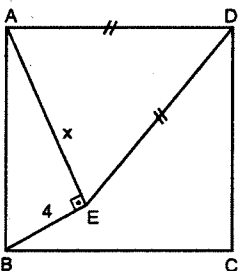
31.



$$x = ?$$

Cevap: $3\sqrt{5}$

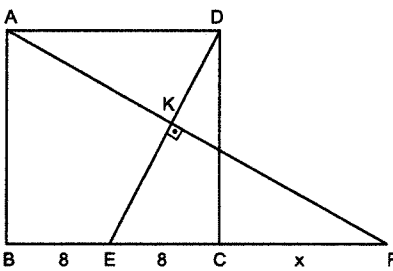
28.



$$x = ?$$

Cevap: 8

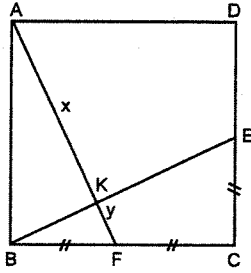
32.



$$x = ?$$

Cevap: 16

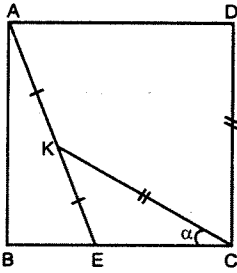
33.



$$\frac{x}{y} = ?$$

Cevap: 4

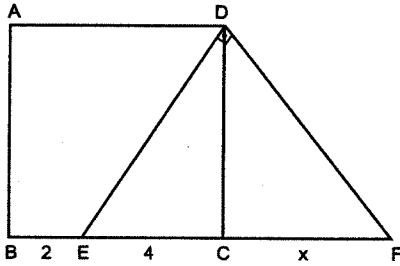
34.



$$\alpha = ?$$

Cevap: 30

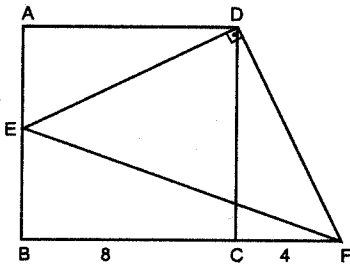
35.



$$x = ?$$

Cevap: 9

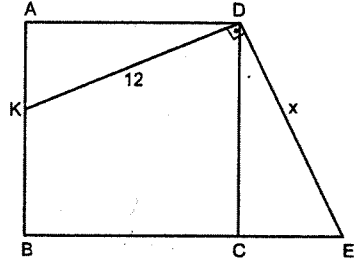
36.



$$|EF| = ?$$

Cevap: $4\sqrt{10}$

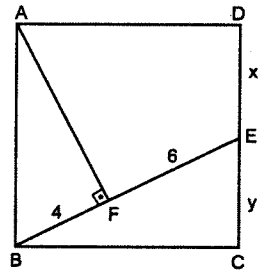
37.



$$x = ?$$

Cevap: 12

38.

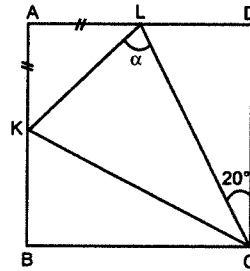


ABCD kare

$$\frac{x}{y} = ?$$

Cevap: 1

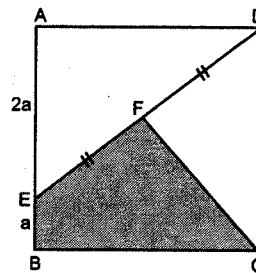
39.



$$\alpha = ?$$

Cevap: 65

40.

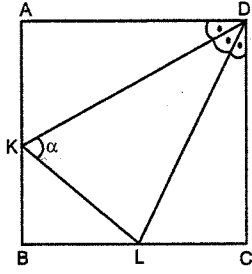


$$T.A = 20$$

$$A(ABCD) = ?$$

Cevap: 48

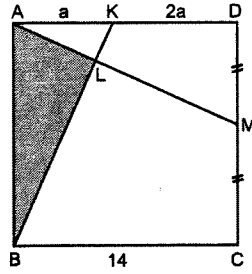
41.



$$\alpha = ?$$

Cevap: 75

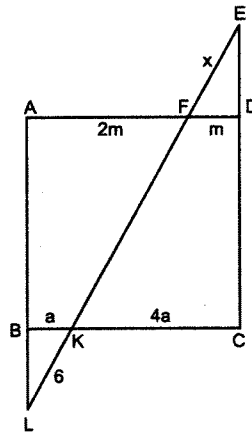
42.



$$T.A = ?$$

Cevap: 28

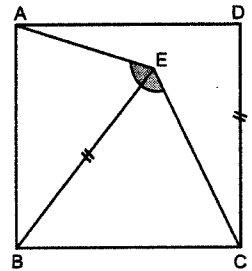
43.



$$x = ?$$

Cevap: 10

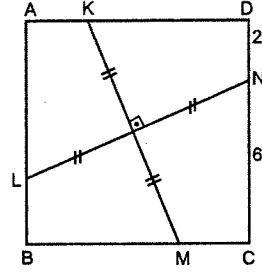
44.



$$m(\widehat{AEC}) = ?$$

Cevap: 135

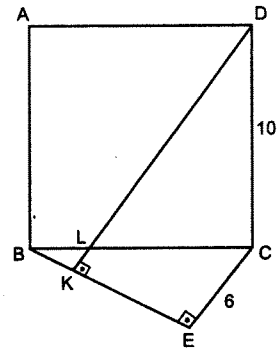
45.



$$|KM| = ?$$

Cevap: $4\sqrt{5}$

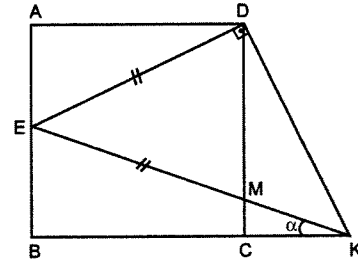
46.



$$|DK| = ?$$

Cevap: 14

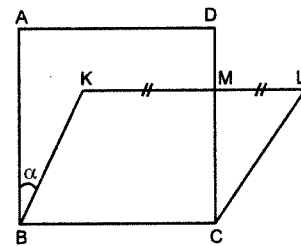
47.



$$\alpha = ?$$

Cevap: 22,5

48.

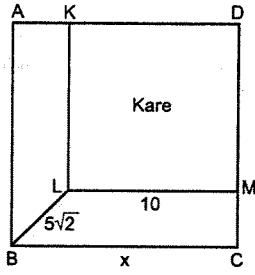
KBCL eşkenar
dörtgen

ABCD kare

$$\alpha = ?$$

Cevap: 30

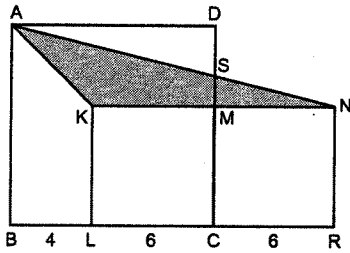
49.



$x = ?$
ABCD kare

Cevap: 15

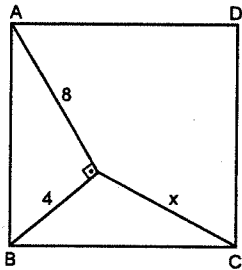
50.



ABCD
KMCL
MNRC kare
T.A = ?

Cevap: 24

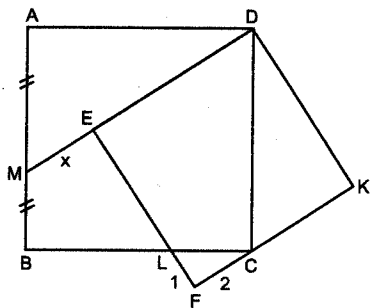
51.



$x = ?$
ABCD kare

Cevap: $4\sqrt{2}$

52.

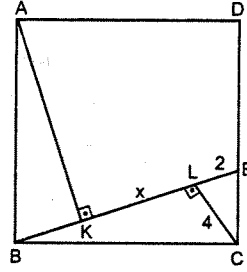


ABCD ve
DEFK kare

 $x = ?$

Cevap: 1

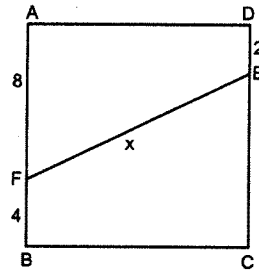
53.



$x = ?$
ABCD kare

Cevap: 4

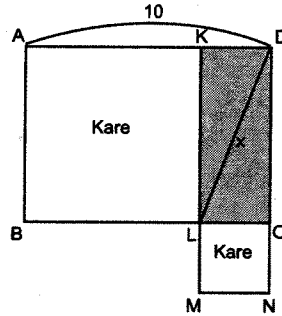
54.



$x = ?$
ABCD kare

Cevap: $6\sqrt{5}$

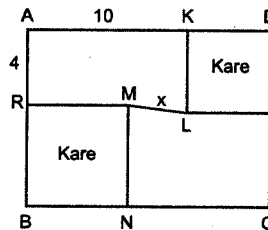
55.



T.A = 18
ABLK ve
LMNC kare
 $x = ?$

Cevap: 8

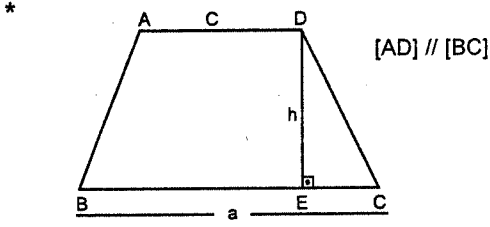
56.



ABCD dikdörtgen
 $x = ?$

Cevap: $\sqrt{17}$

YAMUK

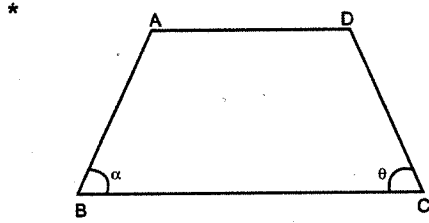


$$\text{Alan}(ABCD) = \frac{(a+c) \cdot h}{2}$$

|AD| = c : üst taban

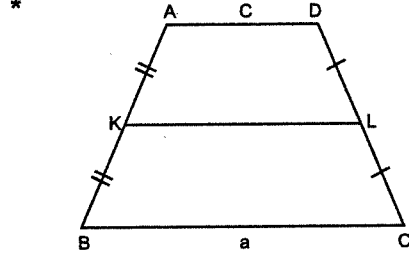
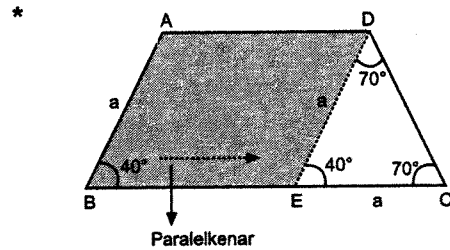
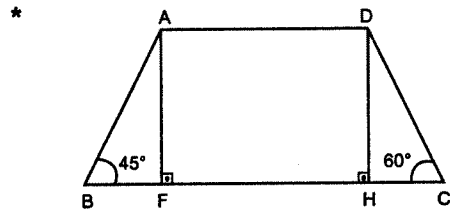
|BC| = a : alt taban

|DE| = h : yükseklik



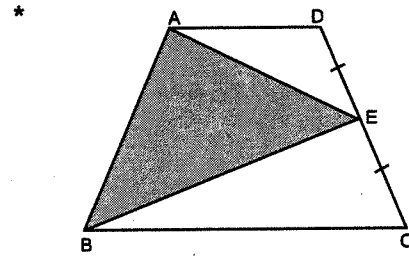
α , θ tanidik açılar ise (30° , 45° , 60°) gibi bu açılardan karşısına dik indirilir.

Tanidik değilse D'den veya A'dan paralel çizeriz. Paralelkenar oluşur.

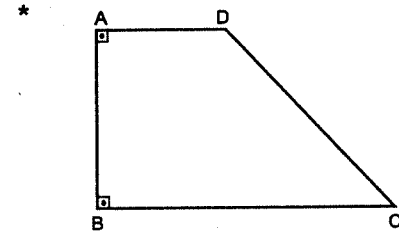
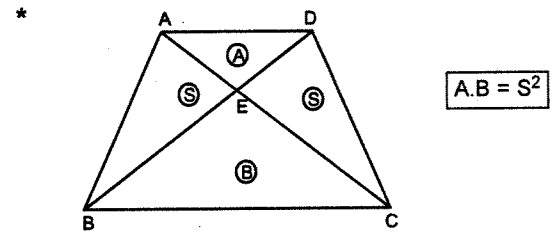


$$|KL| : \text{orta tabandır} = \frac{a+c}{2}$$

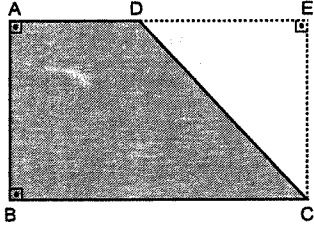
$$(\text{Alan}(ABCD) = \text{ortataban} \times \text{yükseklik})$$



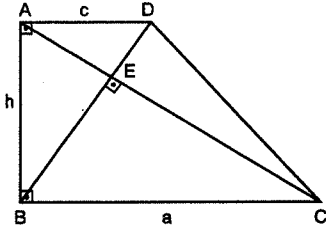
$$\text{Taralı Alan} = \frac{A(ABCD)}{2}$$



Sade Dik yamuk sorularında şekli dikdörtgene çevir.



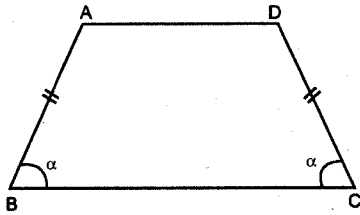
*



Köşegenleri dik keşisen dik yamukta

$$h^2 = a \cdot c \text{ dir.}$$

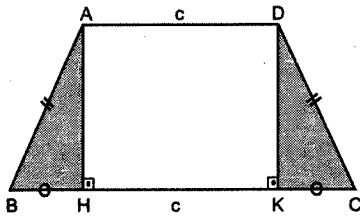
*



ABCD ikizkenar yamuktur.

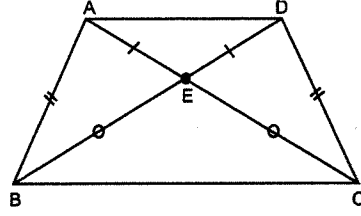
$$|AB| = |DC| \text{ ve } m(\widehat{B}) = m(\widehat{C}) = \alpha$$

*



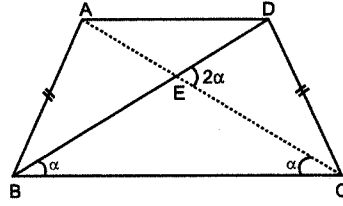
Taralı üçgenler eşittir.

*



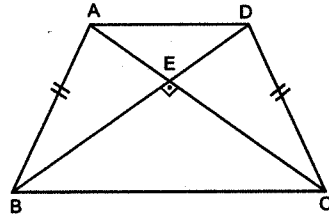
İkizkenar yamukta köşegenler birbirine eşit ve altta ve üstte iki tane ikizkenar üçgen oluşur.

*



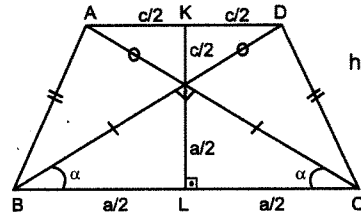
$$\text{Alan}(ABCD) = \frac{|AC| \cdot |BD|}{2} \cdot \sin 2\alpha$$

*



gibi sorularda

*



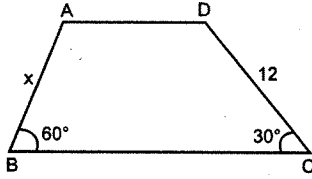
$$h = \frac{a+c}{2} = |KL|$$

$$\text{Alan}(ABCD) = \frac{(a+c) \cdot h}{2}$$

$$= \left(\frac{a+c}{2} \right) \left(\frac{a+c}{2} \right) = h^2$$

Yani ikizkenar yamukta köşegenler dik keşistiği zaman yüksekliğin karesi alana eşittir.

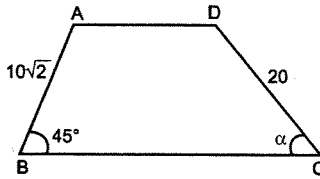
1.



$x = ?$

Cevap: $4\sqrt{3}$

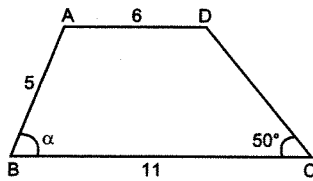
2.



$\alpha = ?$

Cevap: 30

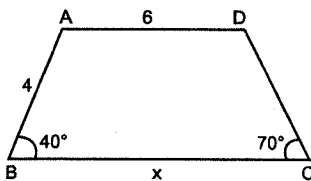
3.



$\alpha = ?$

Cevap: 80

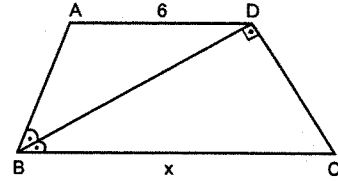
4.



$x = ?$

Cevap: 10

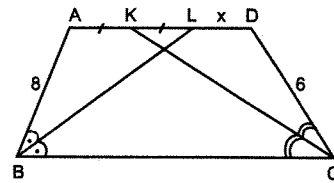
5.



$x = ?$

Cevap: 12

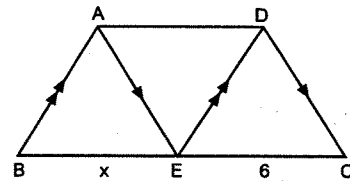
6.



$x = ?$

Cevap: 2

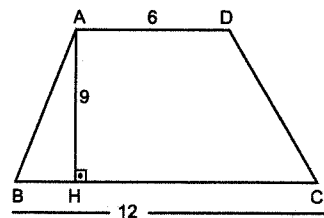
7.



$x = ?$

Cevap: 6

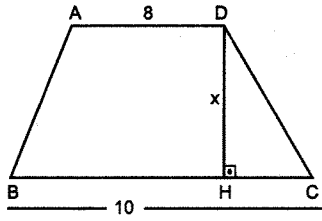
8.



$A(ABCD) = ?$

Cevap: 81

9.

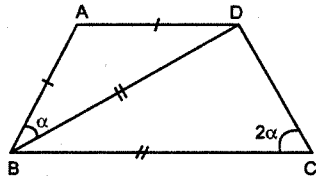


$$A(ABCD) = 54$$

$$x = ?$$

Cevap: 6

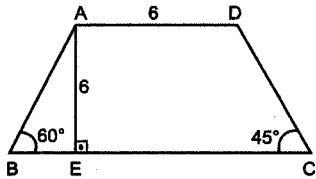
10.



$$\alpha = ?$$

Cevap: 36

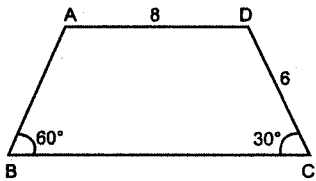
11.



$$A(ABCD) = ?$$

Cevap: $54 + 6\sqrt{3}$

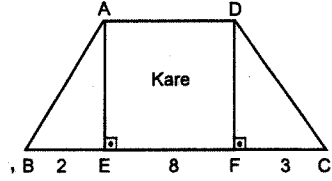
12.



$$A(ABCD) = ?$$

Cevap: $24 + 6\sqrt{3}$

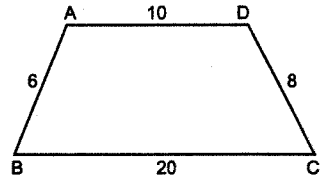
13.



$$A(ABCD) = ?$$

Cevap: 84

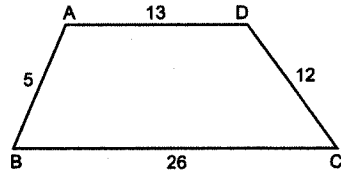
14.



$$A(ABCD) = ?$$

Cevap: 72

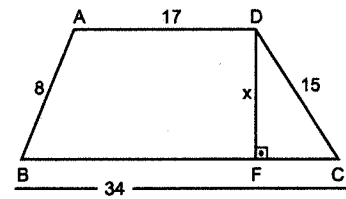
15.



$$A(ABCD) = ?$$

Cevap: 90

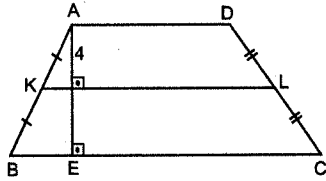
16.



$$x = ?$$

Cevap: $\frac{120}{17}$

17.

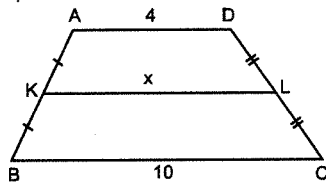


$$|KL| = 12$$

$$A(ABCD) = ?$$

Cevap: 96

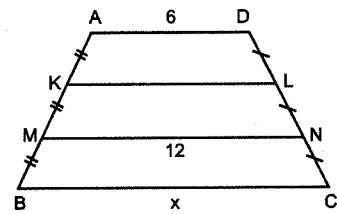
18.



$$x = ?$$

Cevap: 7

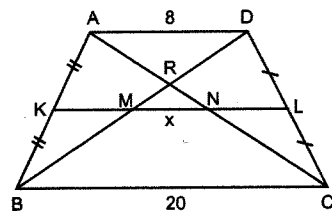
19.



$$x = ?$$

Cevap: 15

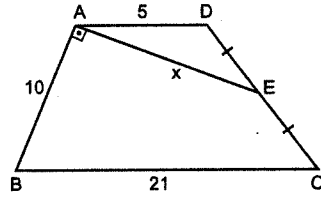
20.



$$x = ?$$

Cevap: 6

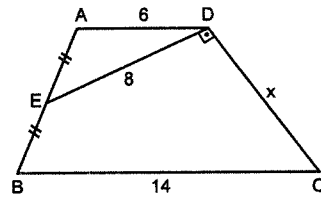
21.



$$x = ?$$

Cevap: 12

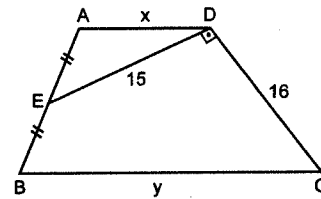
22.



$$x = ?$$

Cevap: 12

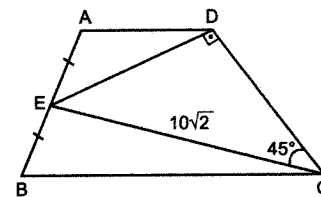
23.



$$y + x = ?$$

Cevap: 34

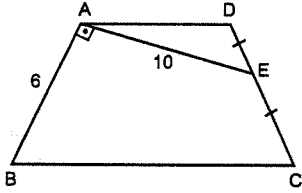
24.



$$A(ABCD) = ?$$

Cevap: 100

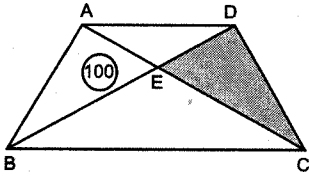
25.



$$A(ABCD) = ?$$

Cevap: 60

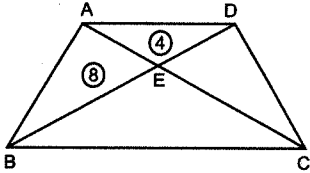
26.



$$T.A = ?$$

Cevap: 100

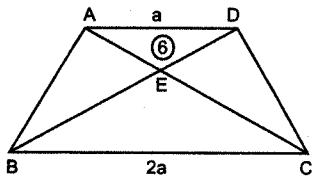
27.



$$A(ABCD) = ?$$

Cevap: 36

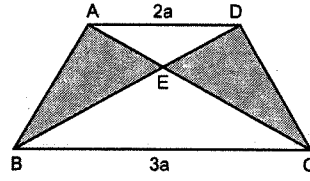
28.



$$A(ABCD) = ?$$

Cevap: 54

29.

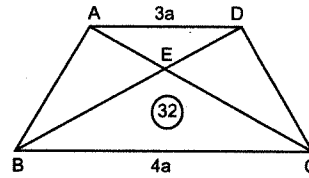


$$A(ABCD) = 100$$

$$T.A = ?$$

Cevap: 48

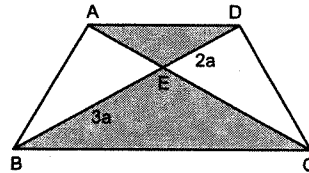
30.



$$A(ABCD) = ?$$

Cevap: 98

31.



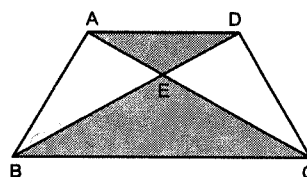
$$3|DE| = 2|EB|$$

$$A(ABCD) = 200$$

$$T.A = ?$$

Cevap: 104

32.



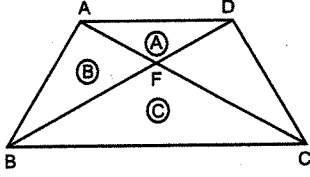
$$T.A = 125$$

$$A(ABCD) = 225$$

$$\frac{|AD|}{|BC|} = ?$$

Cevap: $\frac{1}{2}$

33.



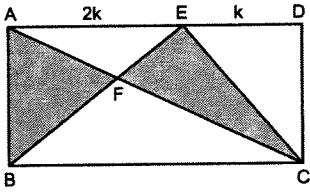
$$B - A = 4$$

$$C - B = 6$$

$$\frac{|AD|}{|BC|} = ?$$

$$\text{Cevap: } \frac{2}{3}$$

34.

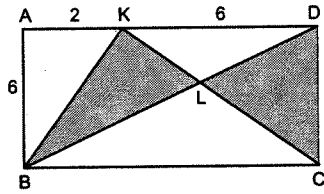


$$\frac{T.A}{A(ABCD)} = ?$$

ABCD
dikdörtgen

$$\text{Cevap: } \frac{2}{5}$$

35.

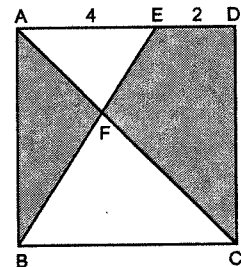


$$T.A = ?$$

ABCD
dikdörtgen

$$\text{Cevap: } \frac{144}{7}$$

36.

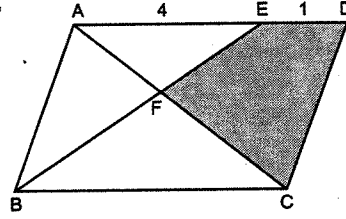


ABCD kare

$$T.A = ?$$

$$\text{Cevap: } \frac{102}{5}$$

37.

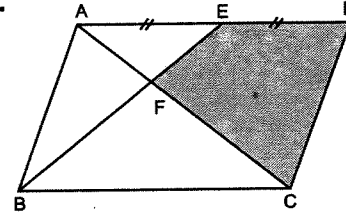


ABCD
Paralelkenar

$$\frac{T.A}{A(ABCD)} = ?$$

$$\text{Cevap: } \frac{29}{90}$$

38.



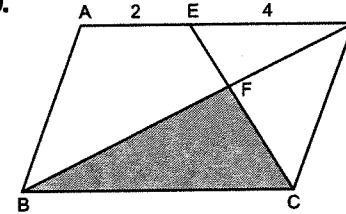
Paralelkenar

$$T.A = 20$$

$$\text{Alan}(ABCD) = ?$$

$$\text{Cevap: } 48$$

39.



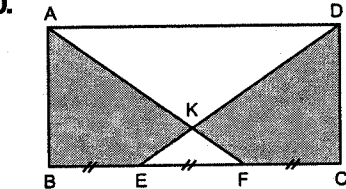
$$m(\widehat{ABC}) = 60^\circ$$

ABCD eşkenar
dörtgen

$$T.A = ?$$

$$\text{Cevap: } \frac{27\sqrt{3}}{5}$$

40.



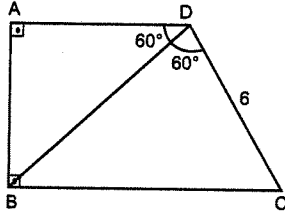
ABCD
Dikdörtgen

$$T.A = 28$$

$$A(ABCD) = ?$$

$$\text{Cevap: } 48$$

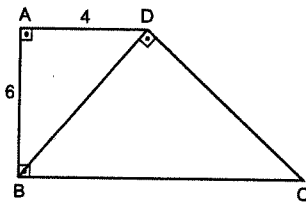
41.



$$A(ABCD) = ?$$

$$\text{Cevap: } \frac{27\sqrt{3}}{2}$$

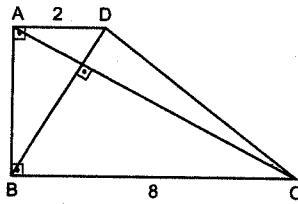
42.



$$A(ABCD) = ?$$

$$\text{Cevap: } 51$$

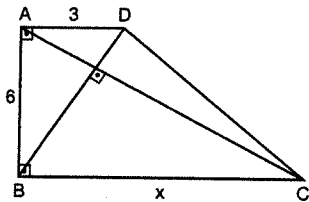
43.



$$A(ABCD) = ?$$

$$\text{Cevap: } 20$$

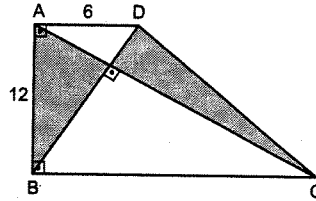
44.



$$x = ?$$

$$\text{Cevap: } 12$$

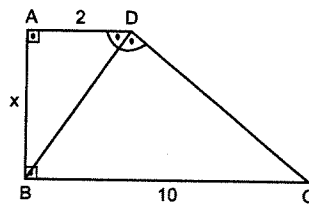
45.



$$T.A = ?$$

$$\text{Cevap: } \frac{288}{5}$$

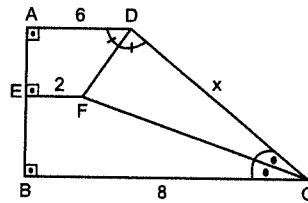
46.



$$x = ?$$

$$\text{Cevap: } 6$$

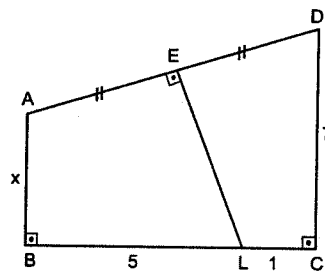
47.



$$x = ?$$

$$\text{Cevap: } 10$$

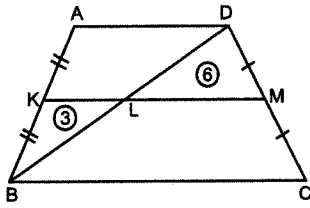
48.



$$x = ?$$

$$\text{Cevap: } 5$$

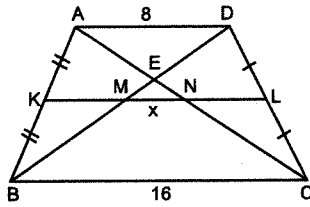
49.



$$A(ABCD) = ?$$

Cevap: 36

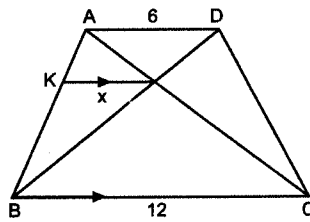
50.



$$x = ?$$

Cevap: 4

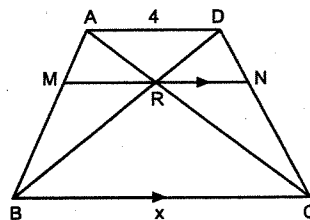
51.



$$x = ?$$

Cevap: 4

52.

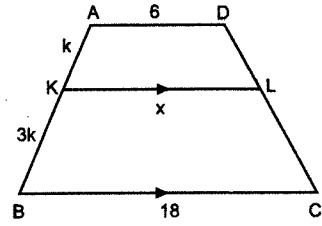


$$|MN| = 6$$

$$x = ?$$

Cevap: 12

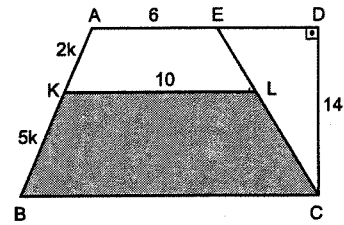
53.



$$x = ?$$

Cevap: 9

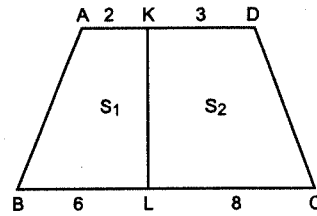
54.



$$T.A = ?$$

Cevap: 150

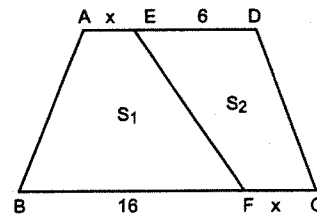
55.



$$\frac{S_1}{S_2} = ?$$

Cevap: $\frac{8}{11}$

56.

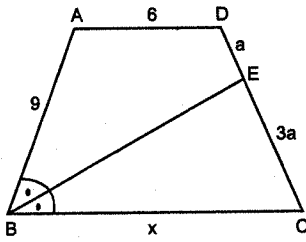


$$\frac{S_1}{S_2} = \frac{5}{3}$$

$$x = ?$$

Cevap: 9

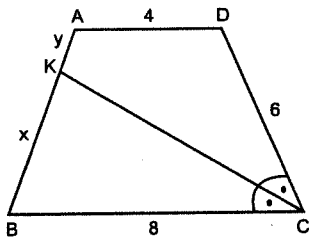
57.



$$x = ?$$

Cevap: 9

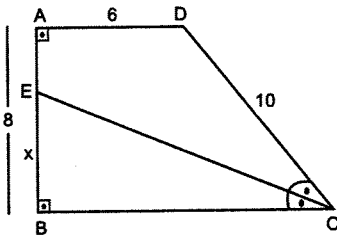
58.



$$\frac{x}{y} = ?$$

Cevap: 4

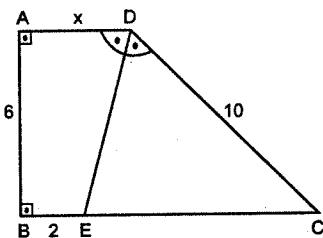
59.



$$x = ?$$

Cevap: 6

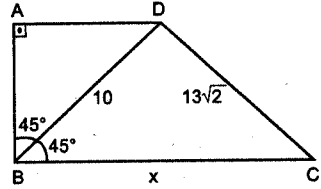
60.



$$x = ?$$

Cevap: 4

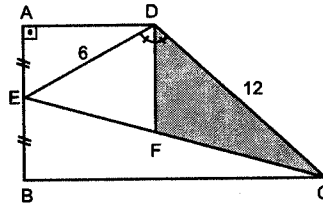
61.



$$x = ?$$

Cevap: $17\sqrt{2}$

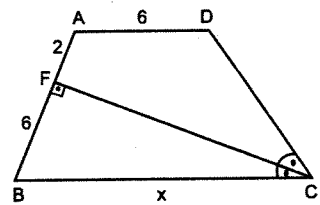
62.



$$\frac{T.A}{A(ABCD)} = ?$$

Cevap: $\frac{1}{3}$

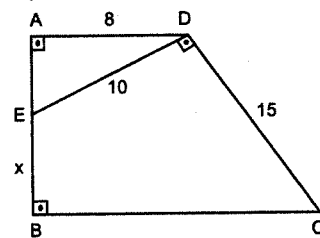
63.



$$x = ?$$

Cevap: 18

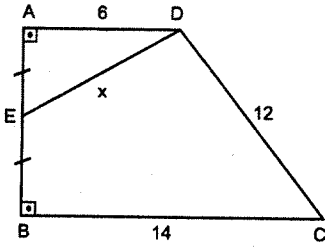
64.



$$x = ?$$

Cevap: 6

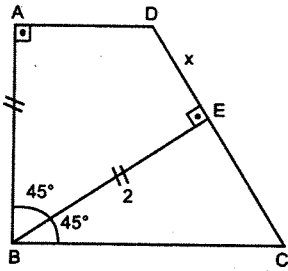
65.



$$x = ?$$

Cevap: $2\sqrt{14}$

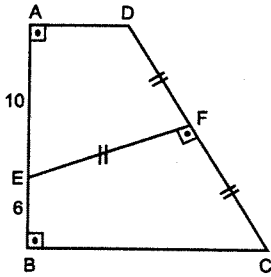
66.



$$x = ?$$

Cevap: $2\sqrt{2} - 2$

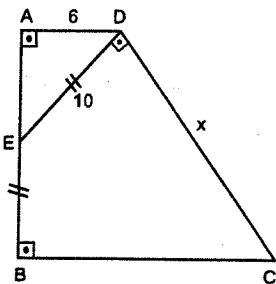
67.



$$A(ABCD) = ?$$

Cevap: 128

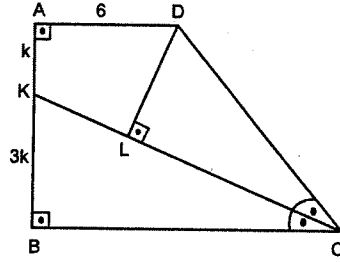
68.



$$x = ?$$

Cevap: 30

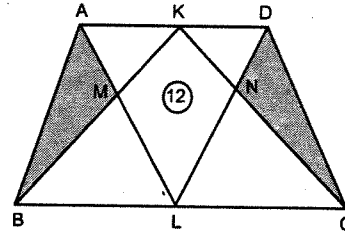
69.



$$\frac{|KL|}{|KC|} = ?$$

Cevap: $\frac{1}{3}$

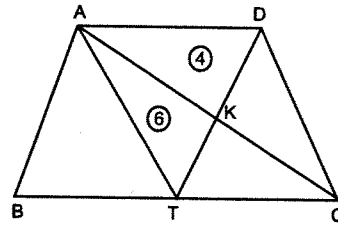
70.



$$T.A = ?$$

Cevap: 12

71.

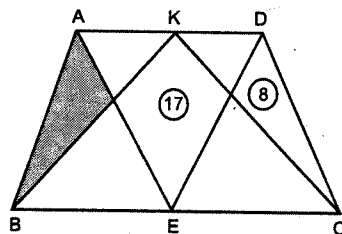


ABTD
Paralelkenar

$$A(ABCD) = ?$$

Cevap: 35

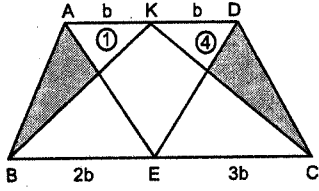
72.



$$T.A = ?$$

Cevap: 9

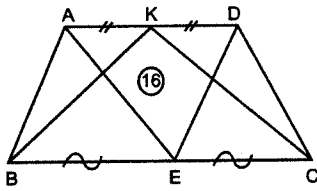
73.



T.A = ?

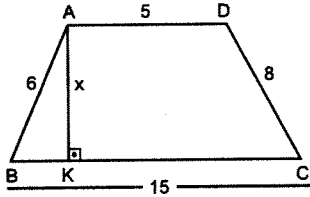
Cevap: 14

74.

ABED
paralelkenar $A(ABCD) = ?$

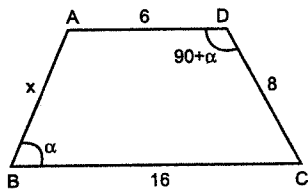
Cevap: 72

75.

 $x = ?$

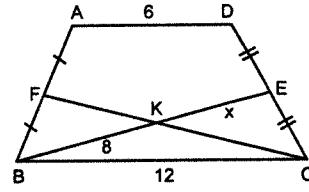
Cevap: 4,8

76.

 $x = ?$

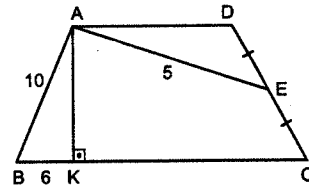
Cevap: 6

77.

 $x = ?$

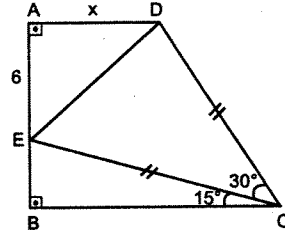
Cevap: 6

78.

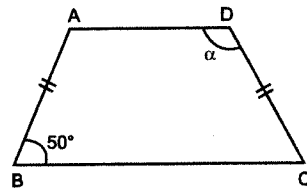
 $A(AKCD) = ?$

Cevap: 24

79.

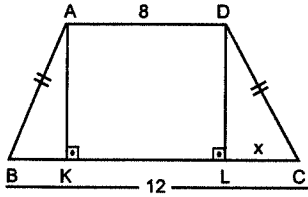
 $x = ?$ Cevap: $2\sqrt{3}$

80.

 $\alpha = ?$

Cevap: 130

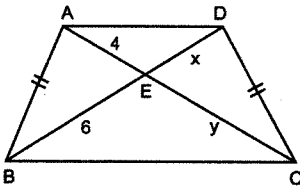
81.



$$x = ?$$

Cevap: 2

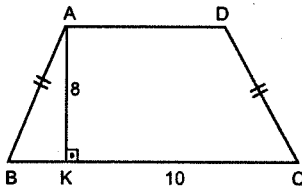
82.



$$y - x = ?$$

Cevap: 2

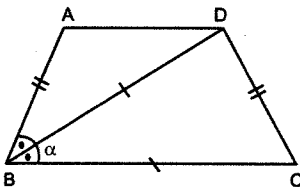
83.



$$A(ABCD) = ?$$

Cevap: 80

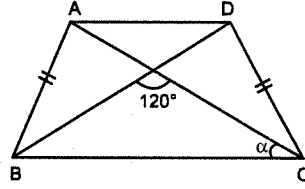
84.



$$\alpha = ?$$

Cevap: 36

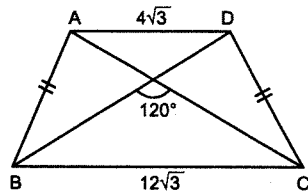
85.



$$\alpha = ?$$

Cevap: 30

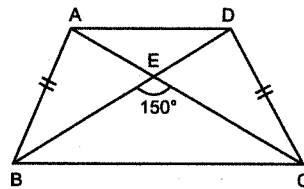
86.



$$A(ABCD) = ?$$

Cevap: $64\sqrt{3}$

87.

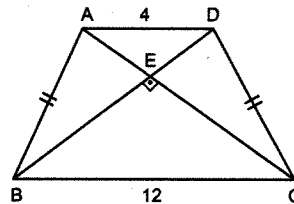


$$|BD| = 10 \text{ cm}$$

$$A(ABCD) = ?$$

Cevap: 25

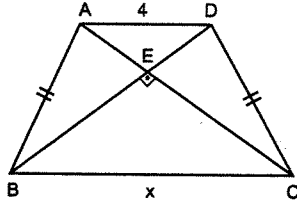
88.



$$A(ABCD) = ?$$

Cevap: 64

89.

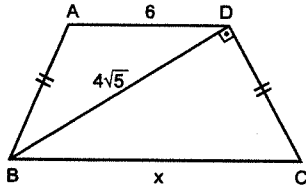


$$A(ABCD) = 100$$

$$x = ?$$

Cevap: 16

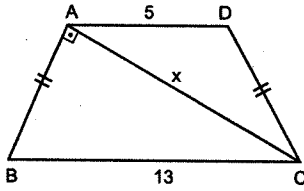
90.



$$x = ?$$

Cevap: 10

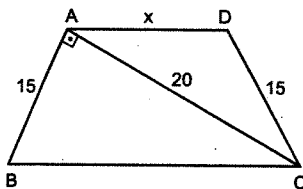
91.



$$x = ?$$

Cevap: $3\sqrt{13}$

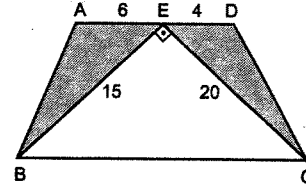
92.



$$x = ?$$

Cevap: 7

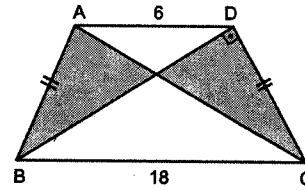
93.



$$T.A = ?$$

Cevap: 60°

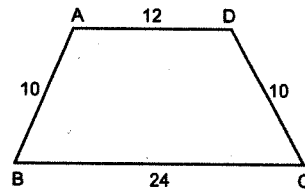
94.



$$T.A = ?$$

Cevap: $27\sqrt{2}$

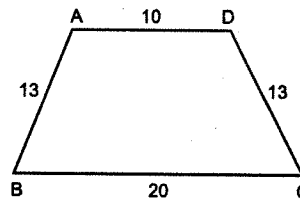
95.



$$Alan(ABCD) = ?$$

Cevap: 144

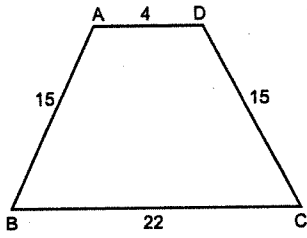
96.



$$A(ABCD) = ?$$

Cevap: 180

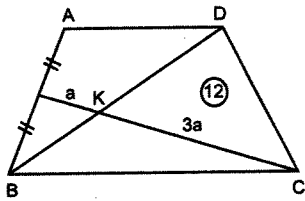
97.



$$A(ABCD) = ?$$

Cevap: 156

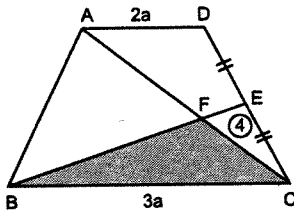
98.



$$A(ABCD) = ?$$

Cevap: 32

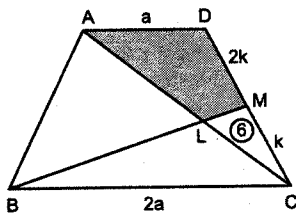
99.



$$T.A = ?$$

Cevap: 12

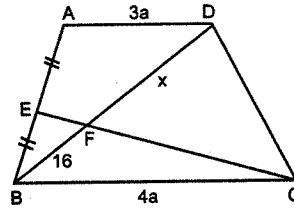
100.



$$T.A = ?$$

Cevap: 57

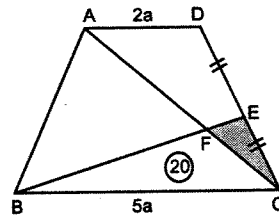
101.



$$x = ?$$

Cevap: 28

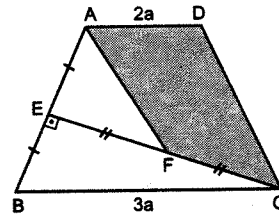
102.



$$T.A = ?$$

Cevap: 4

103.

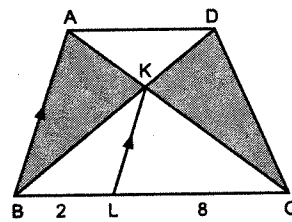


$$T.A = 33$$

$$A(ABCD) = ?$$

Cevap: 60

104.

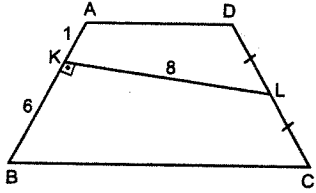


$$T.A = 36$$

$$A(ABCD) = ?$$

Cevap: $\frac{225}{2}$

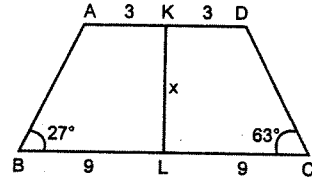
105.



$$A(ABCD) = ?$$

Cevap: 56

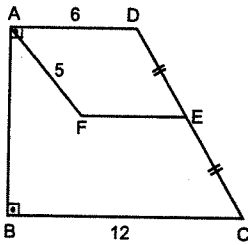
109.



$$x = ?$$

Cevap: 6

106.

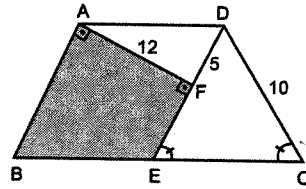


AFED paralelkenar

$$A(AFED) = ?$$

Cevap: 24

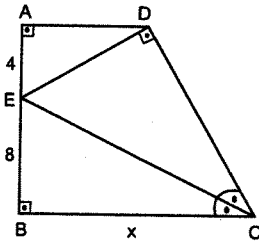
110.



$$T.A = ?$$

Cevap: 90

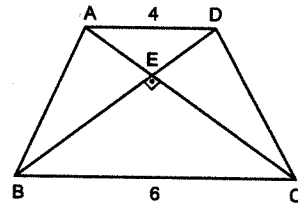
107.



$$x = ?$$

Cevap: $8\sqrt{3}$

111.

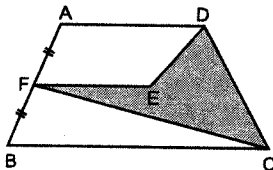


$$|AC| = 8$$

$$|BD| = ?$$

Cevap: 6

108.



AFED paralelkenar

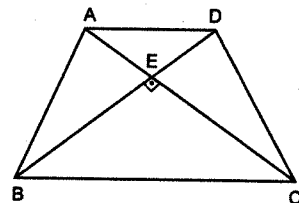
$$T.A = 12$$

$$A(ABCD) = 40$$

$$A(AFED) = ?$$

Cevap: 16

112.



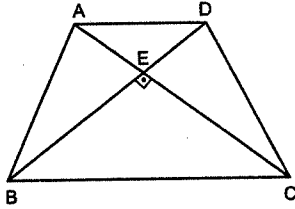
$$|AD| + |BC| = 20$$

$$|AC| = 16$$

$$|BD| = ?$$

Cevap: 12

113.



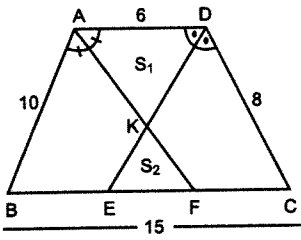
$$|BD| = 8$$

$$|AC| = 15$$

$$|AD| + |BC| = ?$$

Cevap: 17

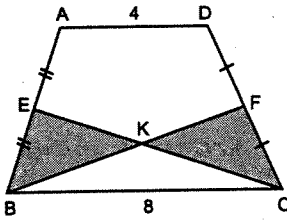
114.



$$\frac{S_1}{S_2} = ?$$

Cevap: 4

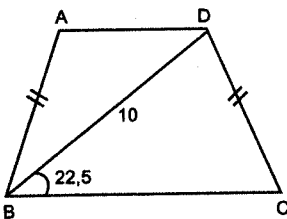
115.



$$\frac{T.A}{A(ABCD)} = ?$$

$$\text{Cevap: } \frac{2}{7}$$

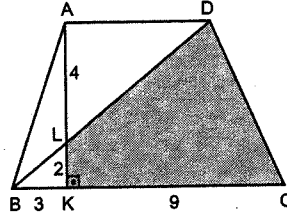
116.



$$A(ABCD) = ?$$

$$\text{Cevap: } 25\sqrt{2}$$

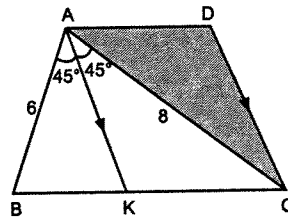
117.



$$T.A = ?$$

Cevap: 33

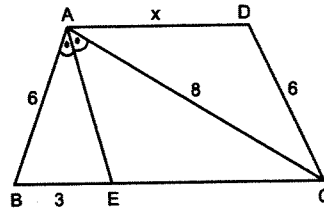
118.



$$T.A = ?$$

$$\text{Cevap: } \frac{96}{7}$$

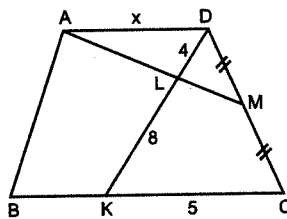
119.



$$x = ?$$

Cevap: 4

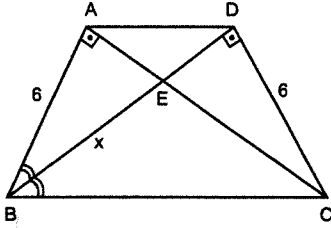
120.



$$x = ?$$

Cevap: 5

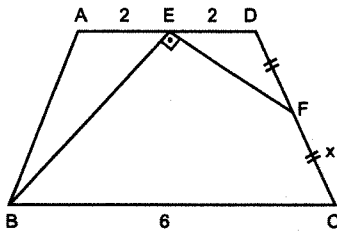
121.



$$x = ?$$

$$\text{Cevap: } 4\sqrt{3}$$

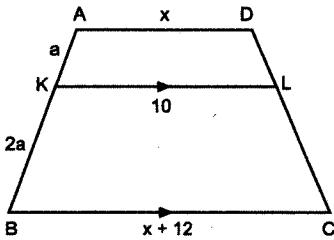
122.



$$x = ?$$

$$\text{Cevap: } 2$$

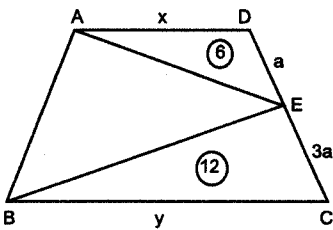
123.



$$x = ?$$

$$\text{Cevap: } 6$$

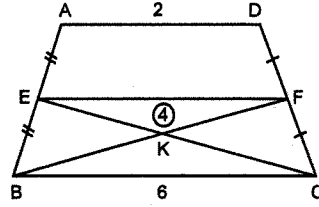
124.



$$\frac{x}{y} = ?$$

$$\text{Cevap: } \frac{3}{2}$$

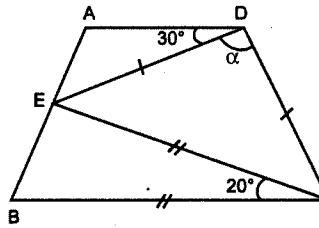
125.



$$A(ABCD) = ?$$

$$\text{Cevap: } 40$$

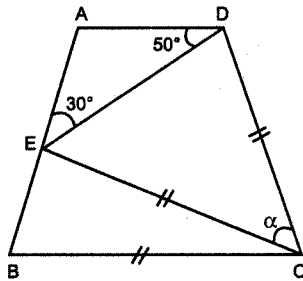
126.



$$\alpha = ?$$

$$\text{Cevap: } 80$$

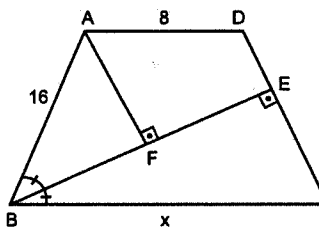
127.



$$\alpha = ?$$

$$\text{Cevap: } 40$$

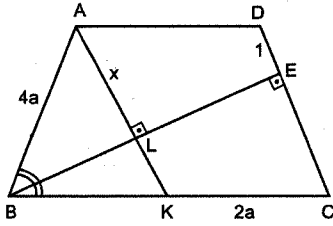
128.



$$x = ?$$

$$\text{Cevap: } 24$$

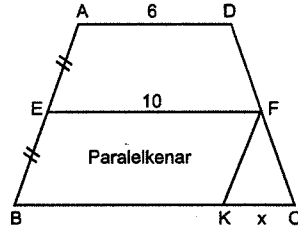
129.



$x = ?$

Cevap: 2

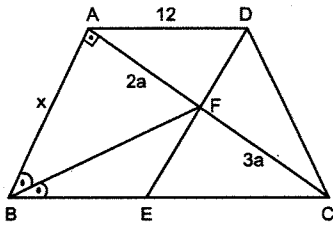
133.



$x = ?$

Cevap: 4

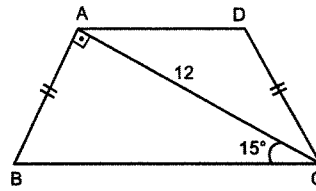
130.

ABED
paralelkenar

$x = ?$

Cevap: 20

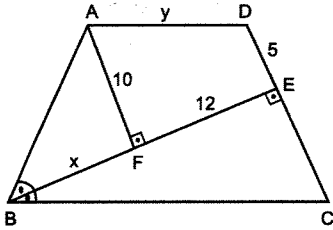
134.



$A(ABCD) = ?$

Cevap: 36

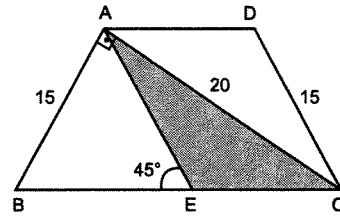
131.



$y + x = ?$

Cevap: 37

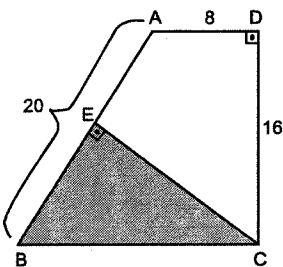
135.



$T.A = ?$

Cevap: 24

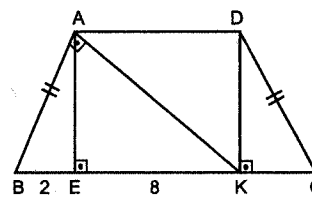
132.



$T.A = ?$

Cevap: 96

136.

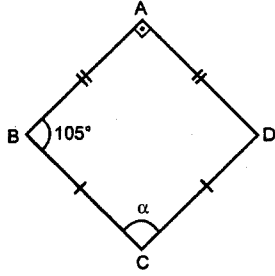


$A(ABCD) = ?$

Cevap: 40

DELTOİD

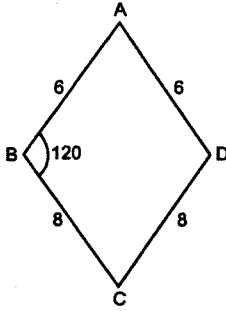
1.



$$\alpha = ?$$

Cevap: 60

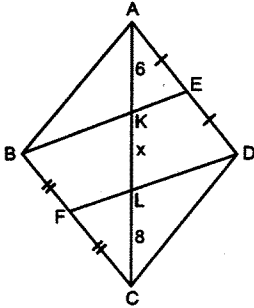
2.



$$A(ABCD) = ?$$

Cevap: $24\sqrt{3}$

3.



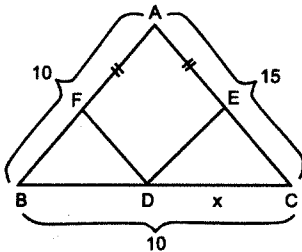
Deltoid

$$|AB| = |AD|$$

$$x = ?$$

Cevap: 7

4.

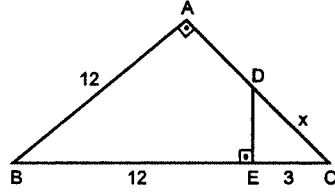


AFDE
Deltoid

$$x = ?$$

Cevap: 6

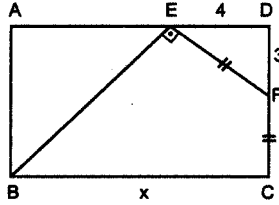
5.



$$x = ?$$

Cevap: 5

6.

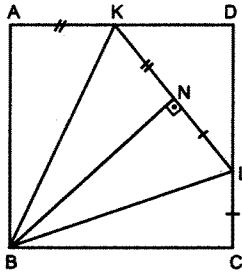


Dikdörtgen

$$x = ?$$

Cevap: 10

7.

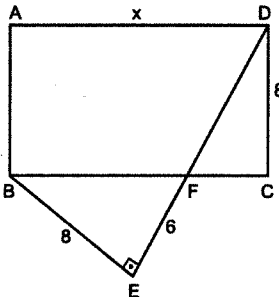


Kare

$$m(\widehat{KBL}) = ?$$

Cevap: 45

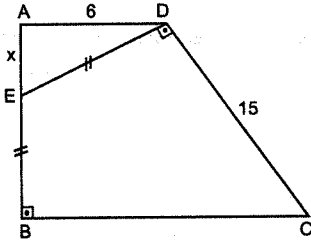
8.



$$x = ?$$

Cevap: 16

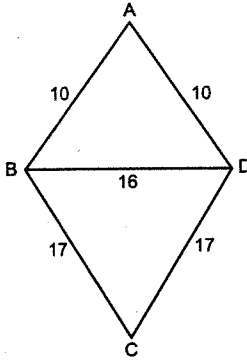
9.



$$x = ?$$

$$\text{Cevap: } \frac{9}{2}$$

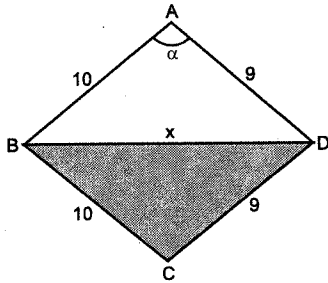
10.



$$A(ABCD) = ?$$

$$\text{Cevap: } 168$$

11.



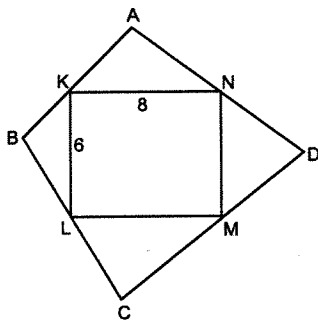
$$\alpha > 90$$

$$T.A = 36$$

$$x = ?$$

$$\text{Cevap: } 17$$

12.



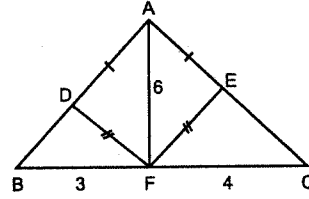
K, L, M, N
orta noktalar

ABCD deltoid

$$A(ABCD) = ?$$

$$\text{Cevap: } 96$$

13.

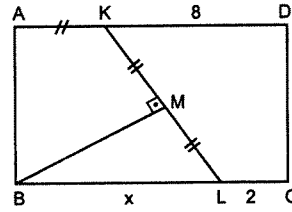


ADFE deltoid

$$\angle(ABC) = ?$$

$$\text{Cevap: } 21$$

14.

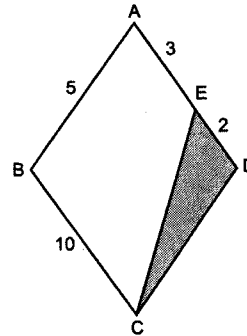


Dikdörtgen

$$x = ?$$

$$\text{Cevap: } 12$$

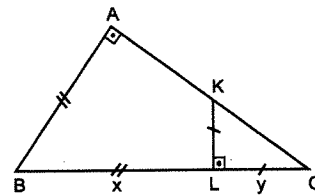
15.



$$\frac{T.A}{A(ABCD)} = ?$$

$$\text{Cevap: } \frac{1}{5}$$

16.

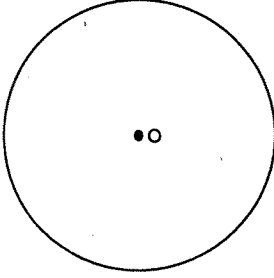


$$\frac{x}{y} = ?$$

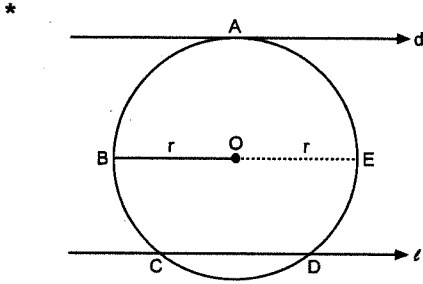
$$\text{Cevap: } \sqrt{2} + 1$$

ÇEMBERDE AÇI

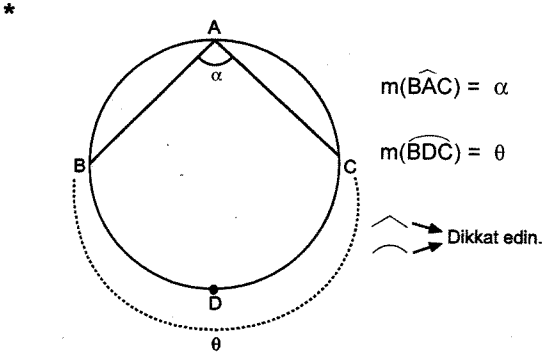
- * Düzlemde sabit bir noktaya eşit uzaklıktaki noktalar kümesine çember denir.



Çember tam açıdır. Yani 360° dir.

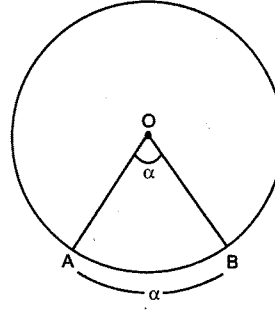


O : Merkez
d : Teğet doğrusu
A : Teğetin değme noktası
l : kesen
[CD] : kiriş
|OB| = r
|EB| = 2r (çap)



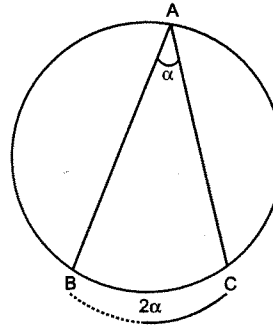
Özellikler: Merkez Açı: Gördüğü yaya eşittir.

1)



$$m(\widehat{AB}) = \alpha$$

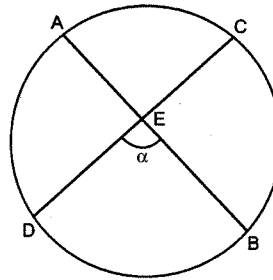
2) Çevre Açısı: Gördüğü yayın yarısına eşittir.



$$m(\widehat{BC}) = 2\alpha$$

3) İç açı: (α)

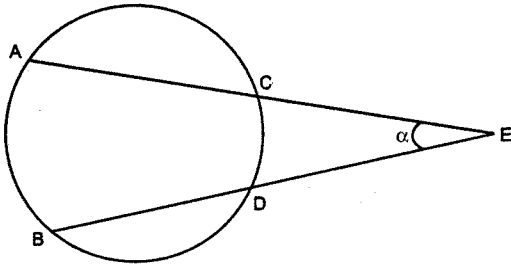
Gördüğü yaylar toplamının yarısına eşittir.



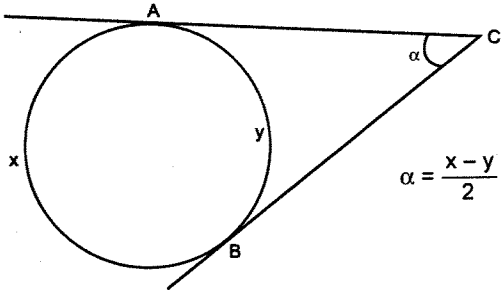
$$\alpha = \frac{m(\widehat{AC}) + m(\widehat{BD})}{2}$$

4) Dış aç: (α)

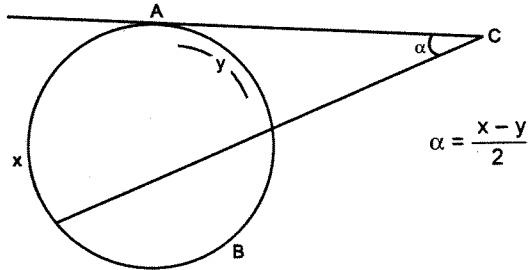
Gördüğü yaylar farkının yarısına eşittir.



$$\frac{m(\widehat{AB}) - m(\widehat{DC})}{2} = \alpha$$



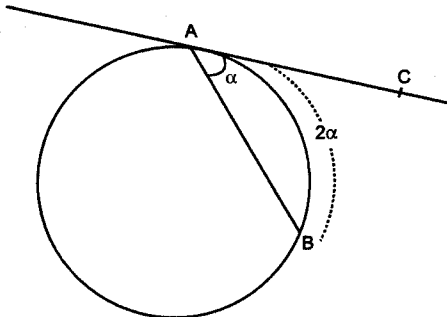
$$\alpha = \frac{x - y}{2}$$



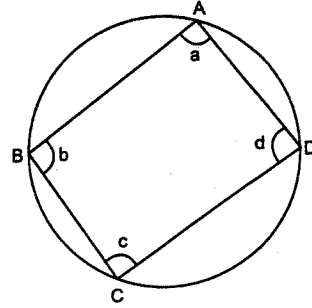
$$\alpha = \frac{x - y}{2}$$

5) Teğet Kiriş Aç: (α)

Gördüğü yayın yarısına eşittir.

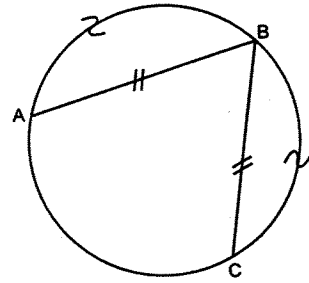


6) Kirişler Dörtgeni

Karşılıklı açların toplamı 180° dir.

$$a + c = b + d = 180^\circ$$

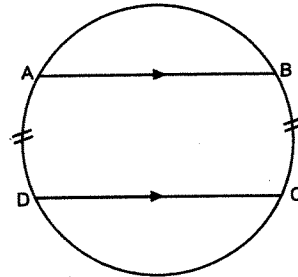
7)



Eşit kırışlerin arkasındaki yaylarda birbirine eşittir.

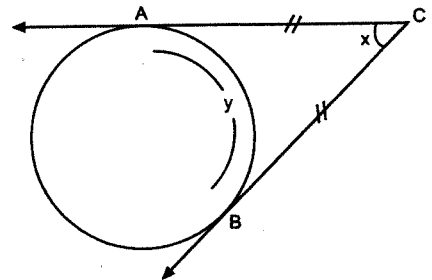
$$|AB| = |CD| \Rightarrow m(\widehat{AB}) = m(\widehat{CD})$$

8)



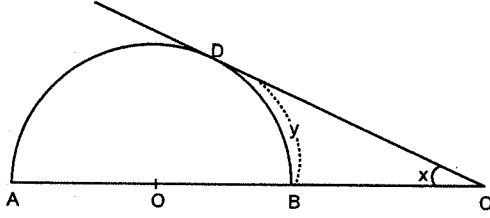
Paralel kırışlerin arasında kalan yaylar eşittir.

9)



$$[CA \text{ ve } [CB \text{ teğet ise } x + y = 180^\circ \text{ ve } |AC| = |BC|$$

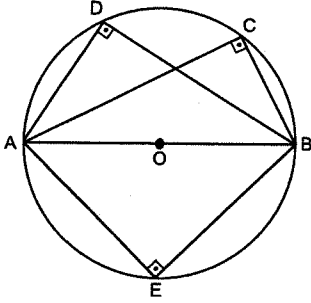
10)



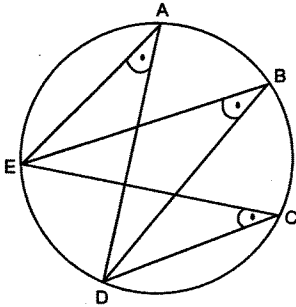
[CA, merkezden geçiyor ve [CD teğet ise

$$x + y = 90^\circ$$

*

Çapı gören çevre açısı 90° dir.

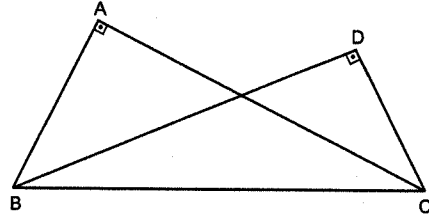
*



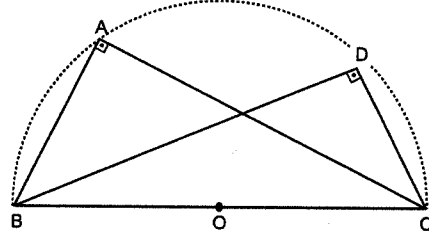
Aynı yayı gören çevre açıları birbirine eşittir.

- Karşılıklı açıları toplamı 180° olan tüm dörtgenlerin etrafından bir çember geçer.
- 90° ler aynı hipotenüsü görüyorlarsa bu 90° lerin etrafından bir çember geçer.

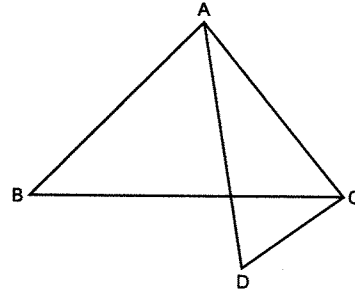
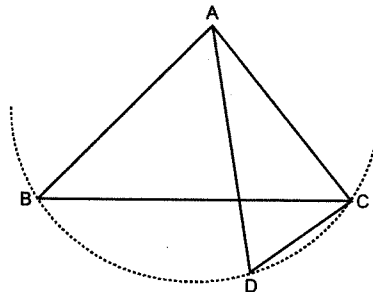
Şekil böyle verilirse



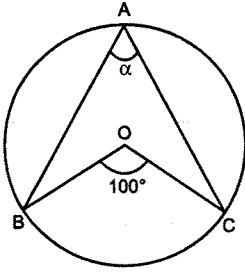
Öğrencinin yapması gerektiği



*


 $|AB| = |AD| = |AC|$
verilirse
A merkezli $|AB|$, $|AD|$ ve $|AC|$ yarıçaplı bir çember oluşur.

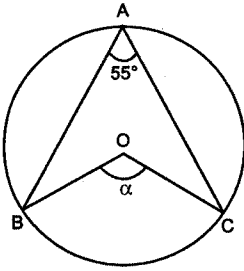
1.



$$\alpha = ?$$

Cevap: 50

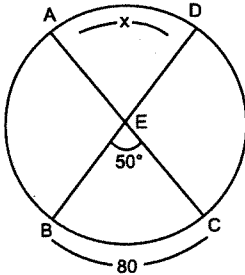
2.



$$\alpha = ?$$

Cevap: 110

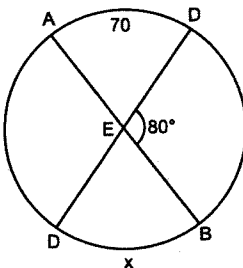
3.



$$x = ?$$

Cevap: 20

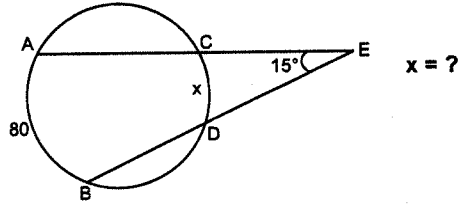
4.



$$x = ?$$

Cevap: 130

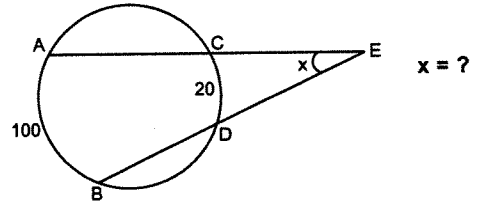
5.



$$x = ?$$

Cevap: 50

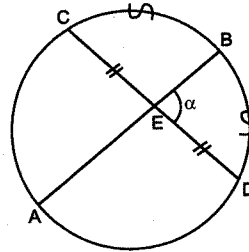
6.



$$x = ?$$

Cevap: 40

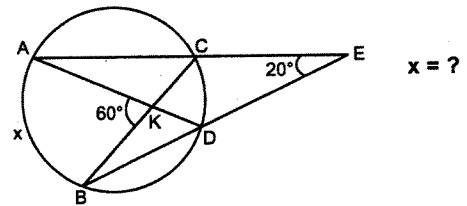
7.



$$\alpha = ?$$

Cevap: 90

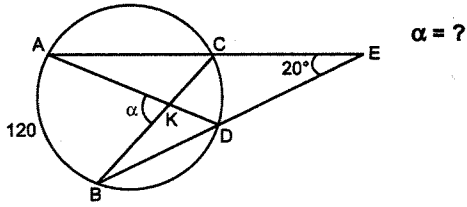
8.



$$x = ?$$

Cevap: 80

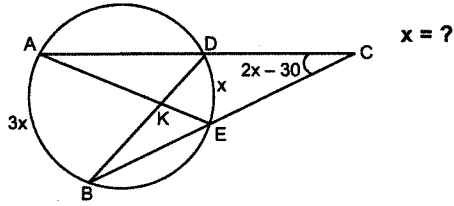
9.



$\alpha = ?$

Cevap: 100

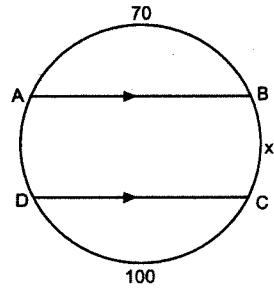
10.



$x = ?$

Cevap: 30

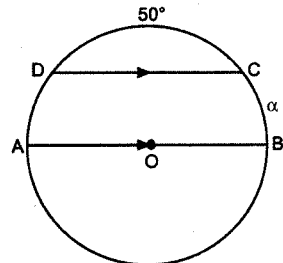
11.



$x = ?$

Cevap: 95

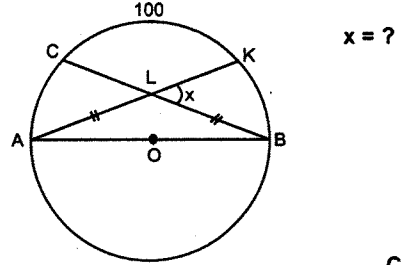
12.



$\alpha = ?$

Cevap: 65

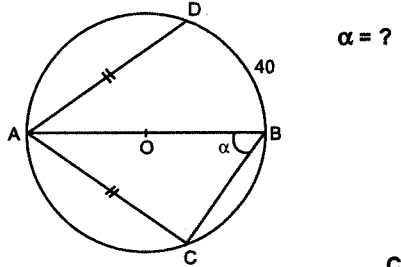
13.



$x = ?$

Cevap: 40

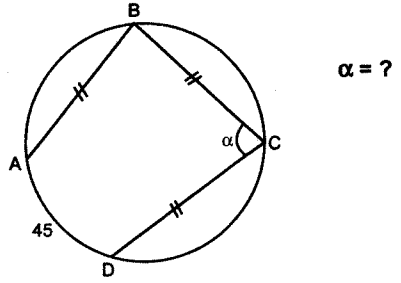
14.



$\alpha = ?$

Cevap: 70

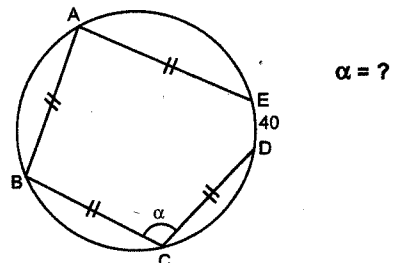
15.



$\alpha = ?$

Cevap: 75

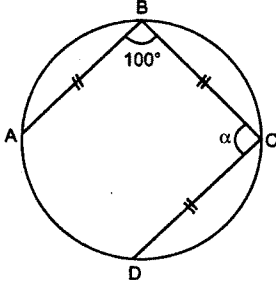
16.



$\alpha = ?$

Cevap: 100

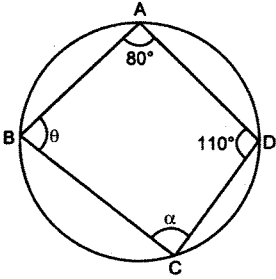
17.



$$\alpha = ?$$

Cevap: 100

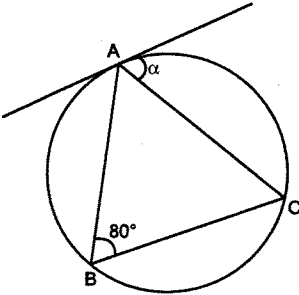
18.



$$\alpha - \theta = ?$$

Cevap: 30

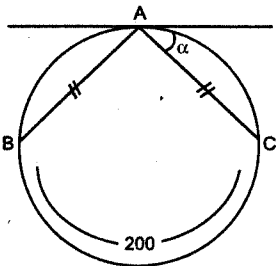
19.



$$\alpha = ?$$

Cevap: 80

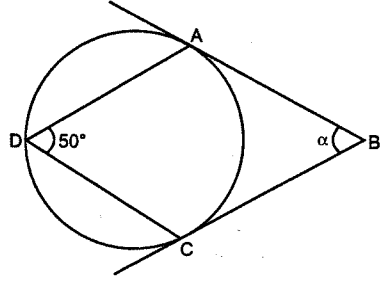
20.



$$\alpha = ?$$

Cevap: 40

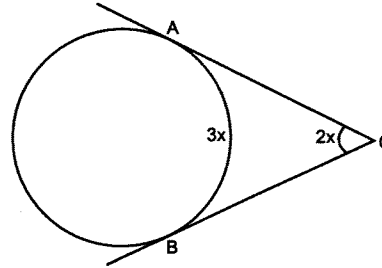
21.



$$\alpha = ?$$

Cevap: 80

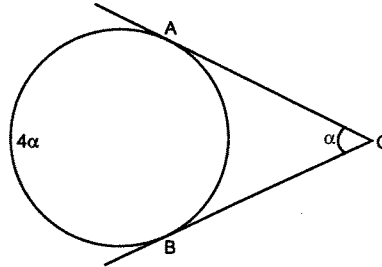
22.



$$x = ?$$

Cevap: 36

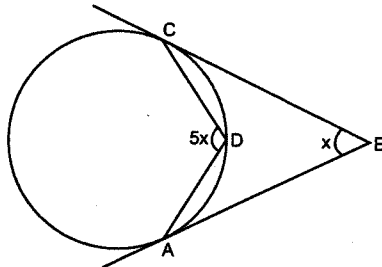
23.



$$\alpha = ?$$

Cevap: 60

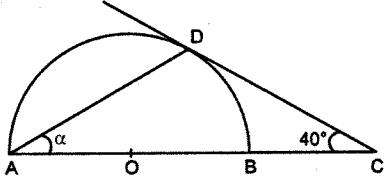
24.



$$x = ?$$

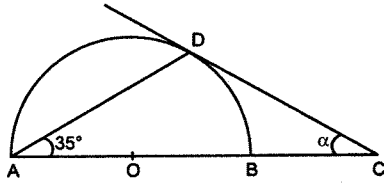
Cevap: 20

25.

 $\alpha = ?$

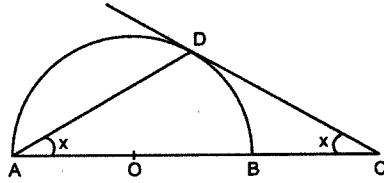
Cevap: 25

26.

 $\alpha = ?$

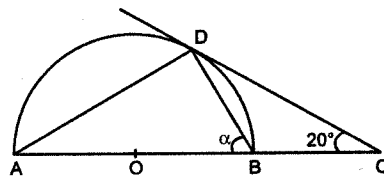
Cevap: 20

27.

 $x = ?$

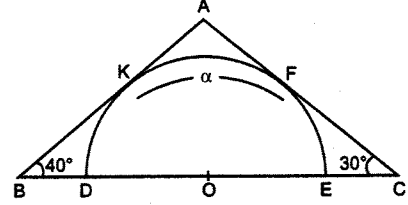
Cevap: 30

28.

 $\alpha = ?$

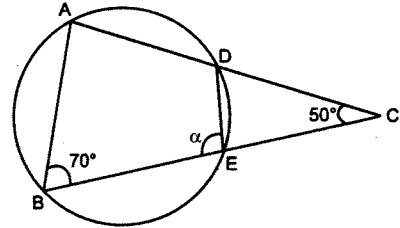
Cevap: 55

29.

 $\alpha = ?$

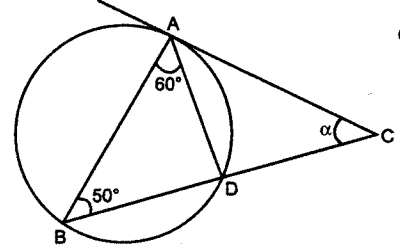
Cevap: 70

30.

 $\alpha = ?$

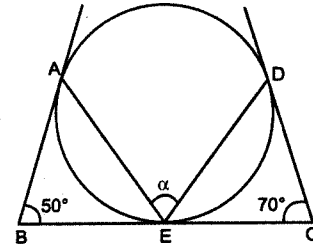
Cevap: 120

31.

 $\alpha = ?$

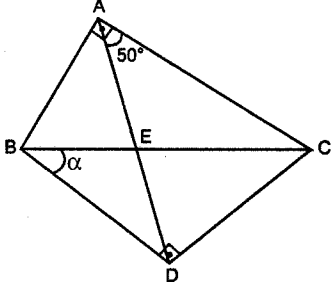
Cevap: 20

32.

 $\alpha = ?$

Cevap: 60

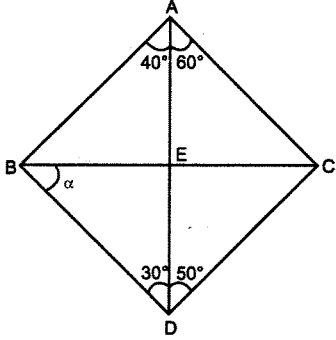
33.



$$\alpha = ?$$

Cevap: 50

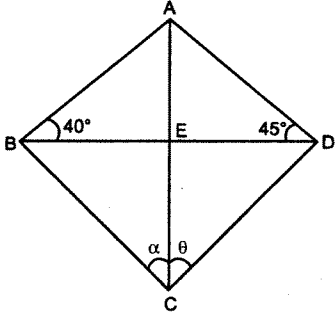
34.



$$\alpha = ?$$

Cevap: 60

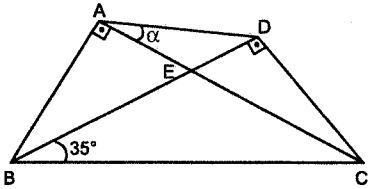
35.

Kirişler
dörtgeni

$$\alpha - \theta = ?$$

Cevap: 5

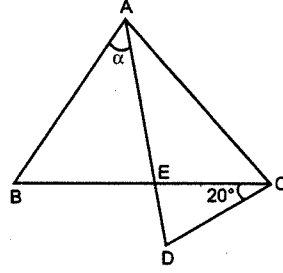
36.



$$\alpha = ?$$

Cevap: 35

37.

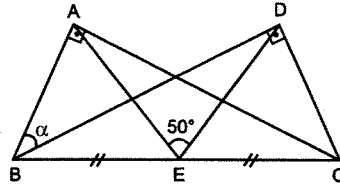


$$|AD| = |AB| = |AC|$$

$$\alpha = ?$$

Cevap: 40

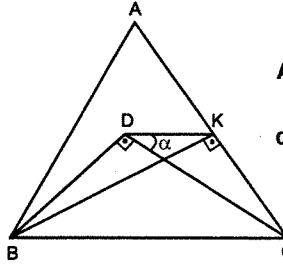
38.



$$\alpha = ?$$

Cevap: 25

39.

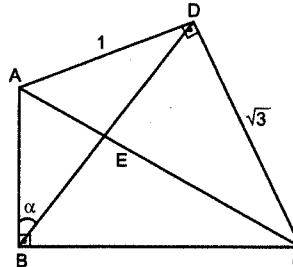


ABC eşkenar üçgen

$$\alpha = ?$$

Cevap: 30

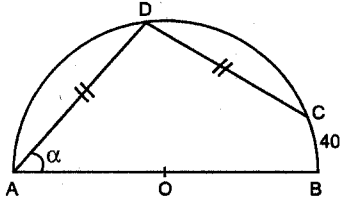
40.



$$\alpha = ?$$

Cevap: 30

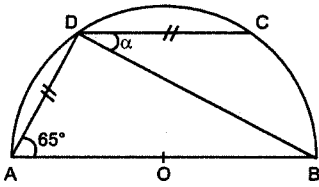
41.



$\alpha = ?$

Cevap: 55

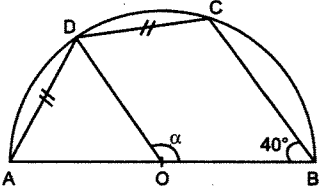
42.



$\alpha = ?$

Cevap: 40

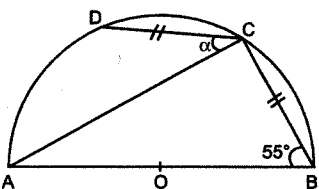
43.



$\alpha = ?$

Cevap: 140

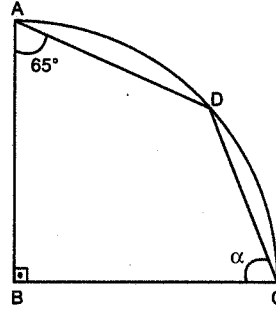
44.



$\alpha = ?$

Cevap: 20

45.

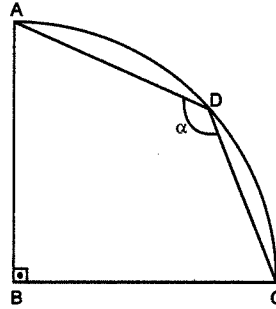


$\alpha = ?$

çeyrek çember

Cevap: 70

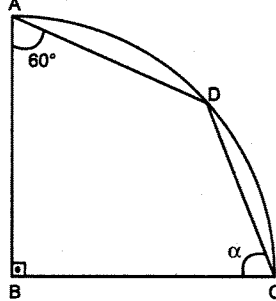
46.



$\alpha = ?$

Cevap: 135

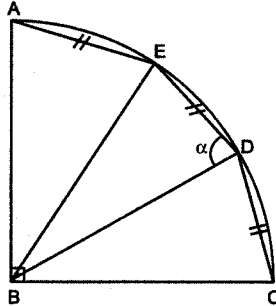
47.



$\alpha = ?$

Cevap: 75

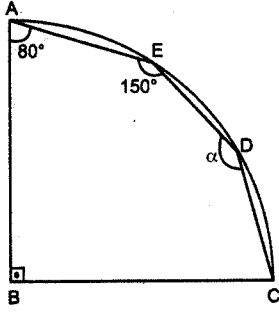
48.



$\alpha = ?$

Cevap: 75

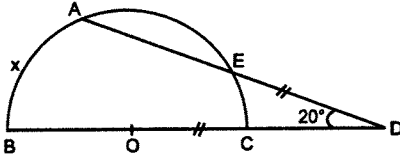
49.



$\alpha = ?$

Cevap: 145°

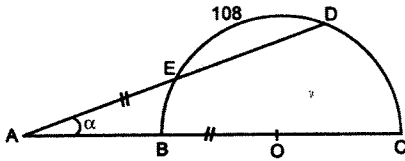
50.



$x = ?$

Cevap: 60

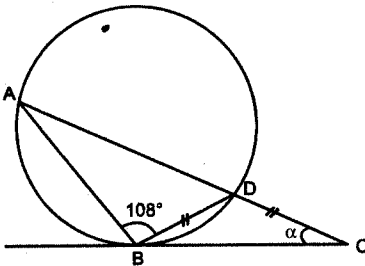
51.



$\alpha = ?$

Cevap: 18

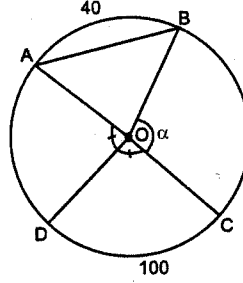
52.



$\alpha = ?$

Cevap: 24

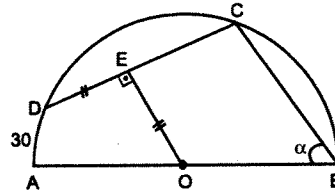
53.



$\alpha = ?$

Cevap: 120

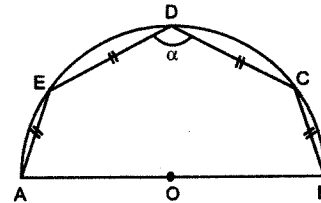
54.



$\alpha = ?$

Cevap: 60

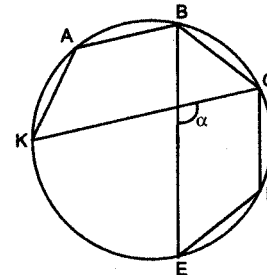
55.



$\alpha = ?$

Cevap: 135

56.



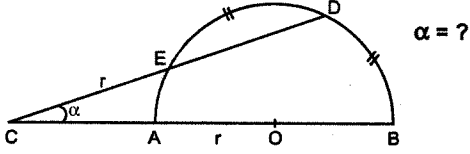
ABCDE...

düzgün
dokuzgen

$\alpha = ?$

Cevap: 80

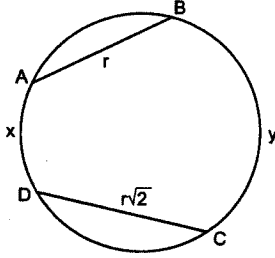
57.



$\alpha = ?$

Cevap: $\frac{180}{7}$

58.

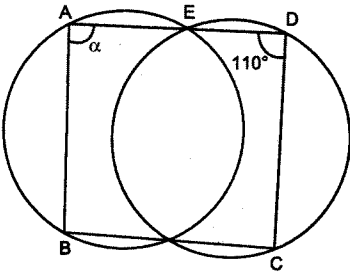


$x + y = ?$

çember yarıçapı
r. dir.

Cevap: 210

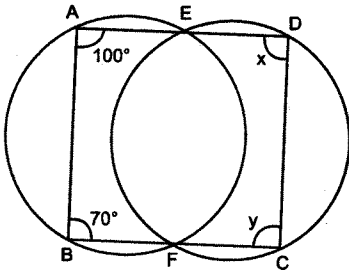
59.



$\alpha = ?$

Cevap: 70

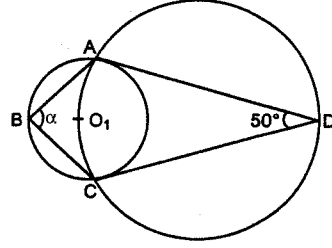
60.



$y - x = ?$

Cevap: 30

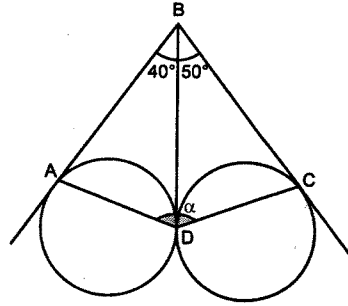
61.



$\alpha = ?$

Cevap: 65

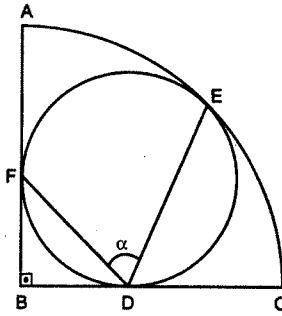
62.



$\alpha = ?$

Cevap: 135

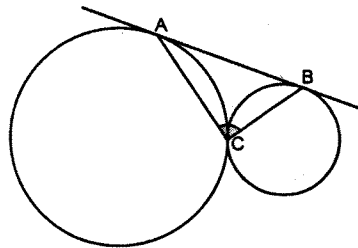
63.



$\alpha = ?$

Cevap: 67,5

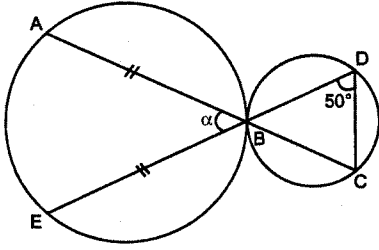
64.



$m(\widehat{ACB}) = ?$

Cevap: 90

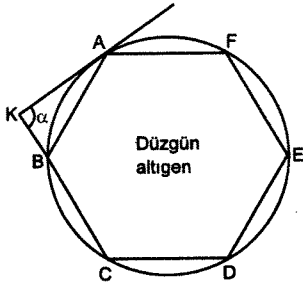
65.



$\alpha = ?$

Cevap: 80

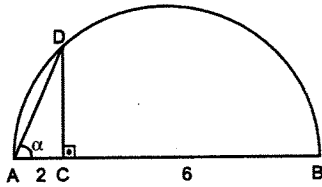
66.



$\alpha = ?$

Cevap: 90

67.

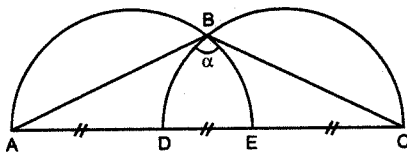


[AB] çap

$\alpha = ?$

Cevap: 60

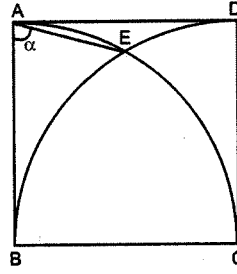
68.



$\alpha = ?$

Cevap: 120

69.

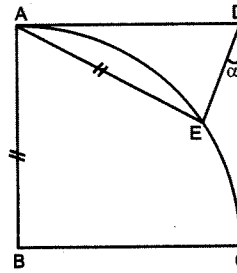


Kare

$\alpha = ?$

Cevap: 75

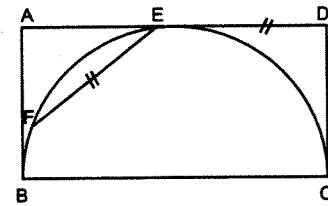
70.



$\alpha = ?$

Cevap: 15

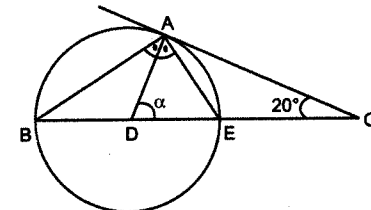
71.



$m(\widehat{FB}) = ?$

Cevap: 30

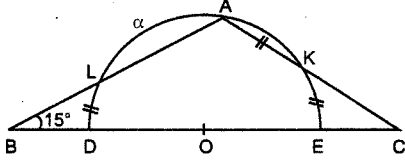
72.



$\alpha = ?$

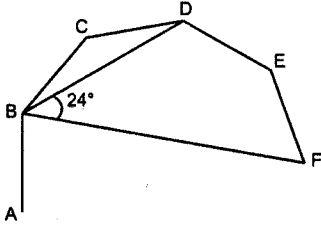
Cevap: 80

73.

 $\alpha = ?$

Cevap: 90

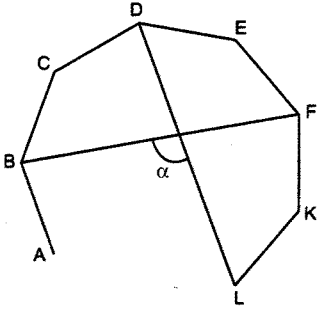
74.



ABCDE ...
düzgün
çokgeni kaç
kenarlıdır?

Cevap: 15

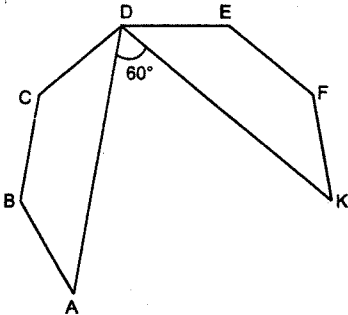
75.



ABCDE ...
düzgün
onikigen ise

Cevap: 120

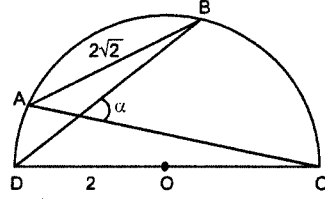
76.



ABCDE ...
düzgün
çokgeni kaç
kenarlıdır?

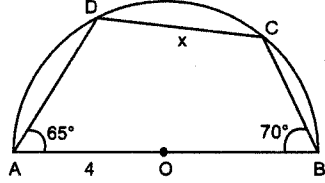
Cevap: 9

77.

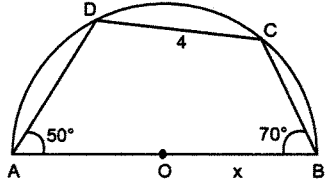
 $\alpha = ?$

Cevap: 45

78.

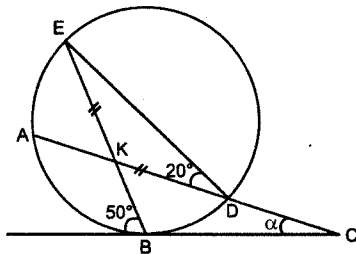
 $x = ?$ Cevap: $4\sqrt{2}$

79.

 $x = ?$

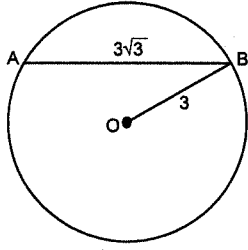
Cevap: 4

80.

 $\alpha = ?$

Cevap: 10

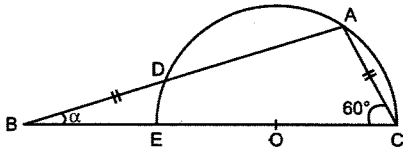
81.



$\alpha = ?$

Cevap: 120

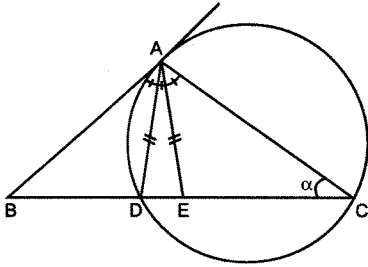
82.



$\alpha = ?$

Cevap: 20

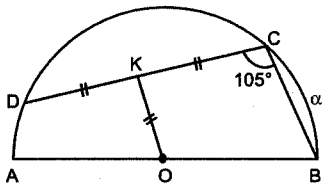
83.



$\alpha = ?$

Cevap: 36

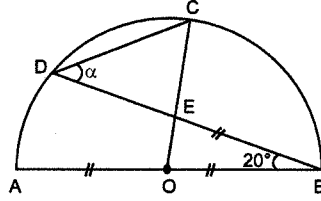
84.



$\alpha = ?$

Cevap: 60

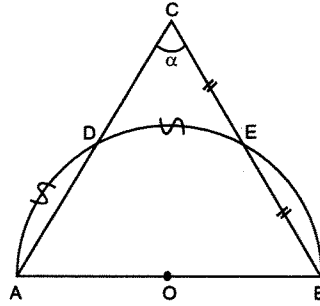
85.



$\alpha = ?$

Cevap: 40

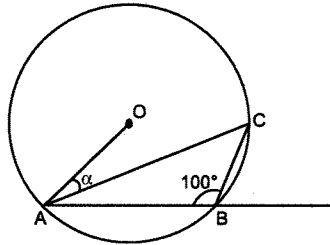
86.



$\alpha = ?$

Cevap: 60

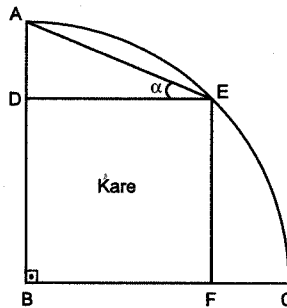
87.



$\alpha = ?$

Cevap: 10

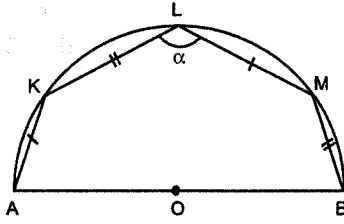
88.



$\alpha = ?$

Cevap: 22,5

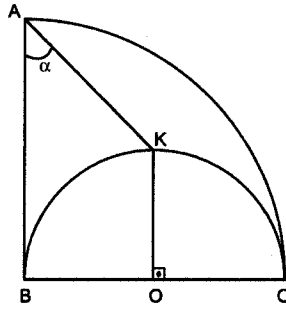
89.



$\alpha = ?$

Cevap: 135

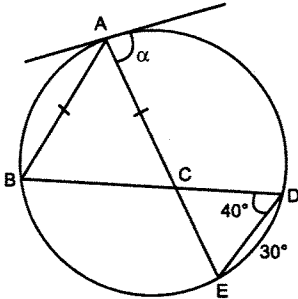
90.



$\alpha = ?$

Cevap: 45

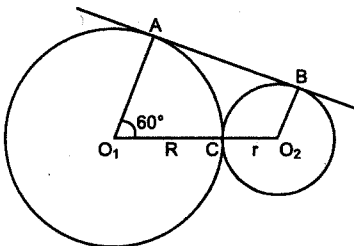
91.



$\alpha = ?$

Cevap: 85

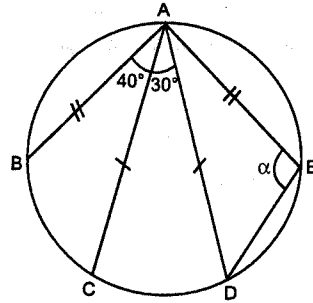
92.



$\frac{R}{r} = ?$

Cevap: 3

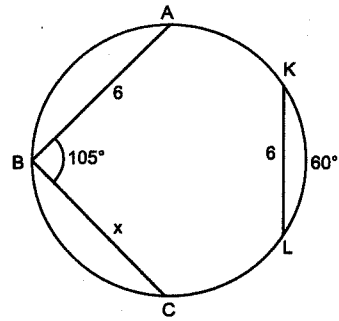
93.



$\alpha = ?$

Cevap: 105

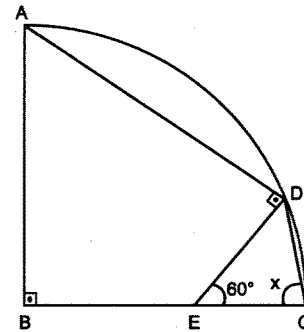
94.



$x = ?$

Cevap: $6\sqrt{2}$

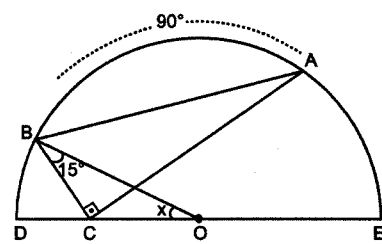
95.



$x = ?$

Cevap: 75

96.

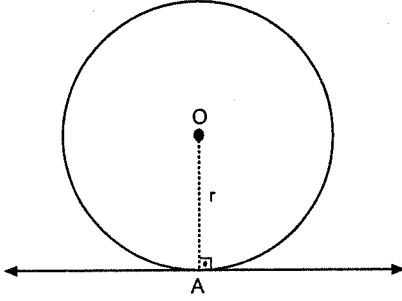


$x = ?$

Cevap: 30

ÇEMBERDE UZUNLUK

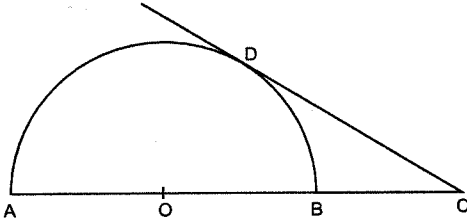
1.



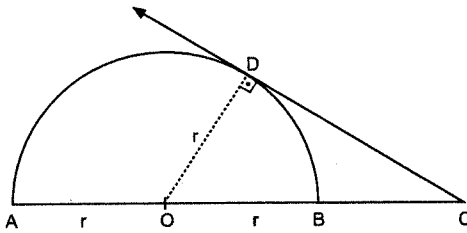
Merkezden teğetin değme noktasına çizilen yarıçap teğete diktir.

Çemberde uzunluk sorularının çoğunda, merkezden teğetin değme noktasına dik indirin ve yarıçap olduğunu şekilde gösterir.

Örnek:

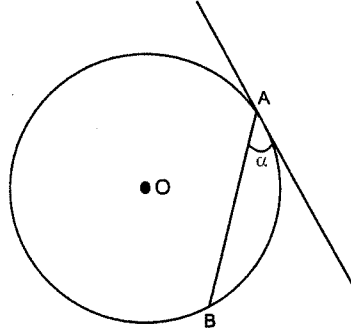


Şekilde verilen

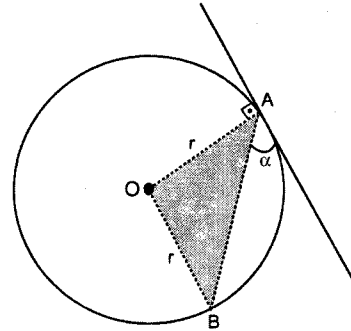


Öğrencinin yapacağı

Örnek:

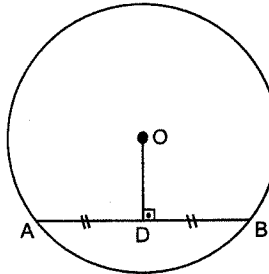


α tanıdık bir açı ise



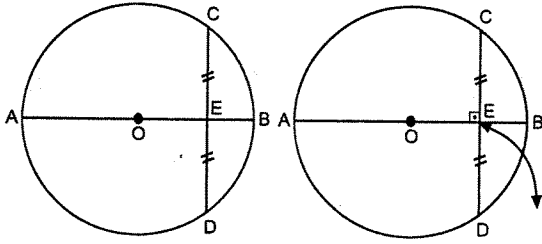
Öğrencinin yapacağı

2.



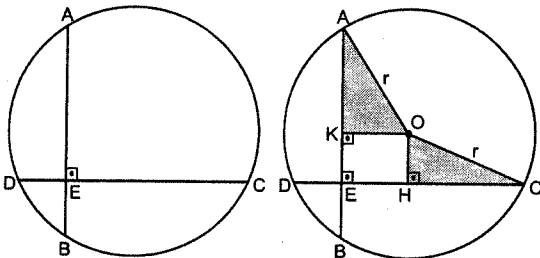
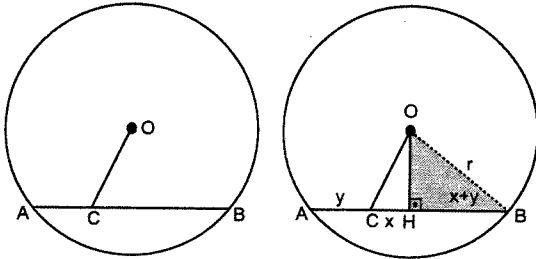
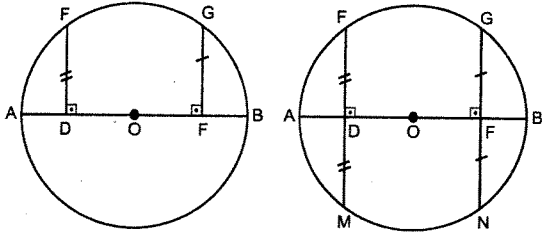
Merkezden kirişe indirilen dik, kirişi ikiye ayırır.

Örnek:



Şekilde verilen

Öğrencinin yapacağı

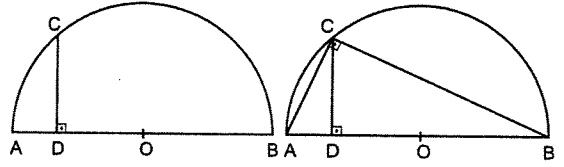


$$|AK| = |KB|$$

$$|DH| = |HC|$$

3. Çapı gören çevre açısı 90° dir.

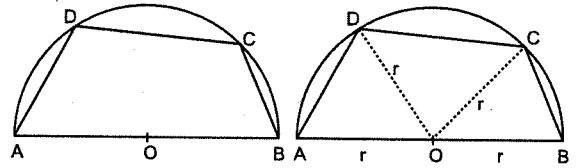
→ Öklid bağıntısı



Şekilde verilen

Öğrencinin yapacağı

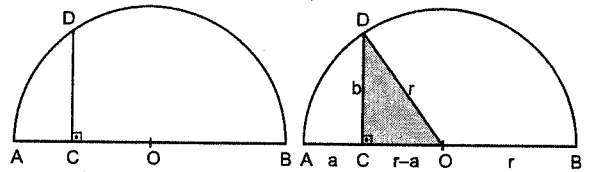
4. Merkezden uygun noktalara yarıçap çekeriz.



(İkizkenar üçgenler çıkıyor.)

Şekilde verilen

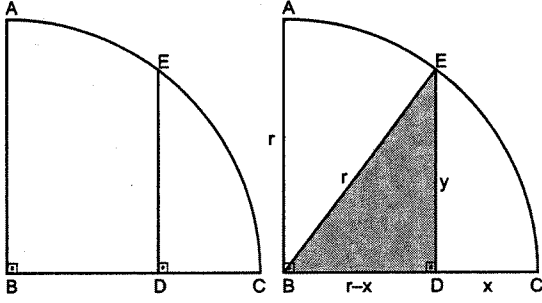
Öğrencinin yapacağı



(Pisagor bağıntısı)

Şekilde verilen

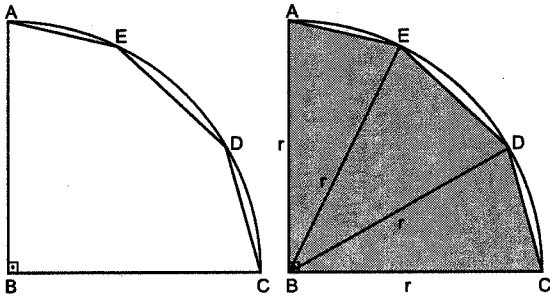
Öğrencinin yapacağı



(Pisagor bağıntısı)

Şekilde verilen

Öğrencinin yapacağı

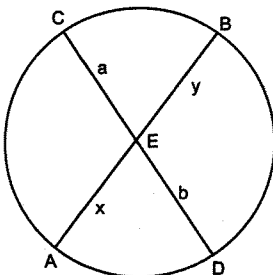


(İkizkenar üçgenler)

Şekilde verilen

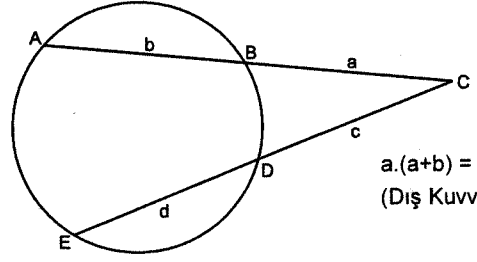
Öğrencinin yapacağı

5. İç Kuvvet ve Dış Kuvvet yaparız.



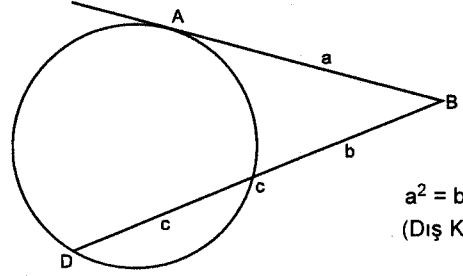
$$x \cdot y = a \cdot b$$

İç Kuvvet



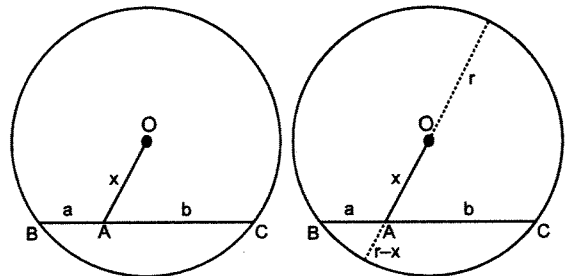
$$a \cdot (a+b) = c \cdot (c+d)$$

(Dış Kuvvet)



$$a^2 = b \cdot (b+c)$$

(Dış Kuvvet)



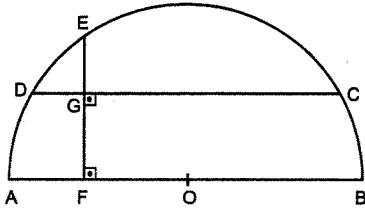
$$(r-x)(r+x) = a \cdot b$$

İç Kuvvet

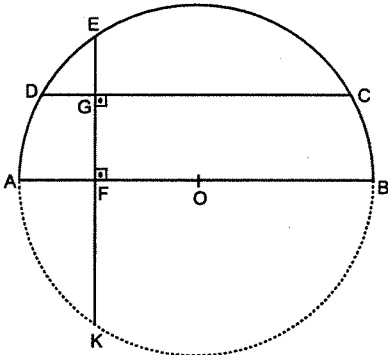
Şekilde verilen

Öğrencinin yapacağı

*



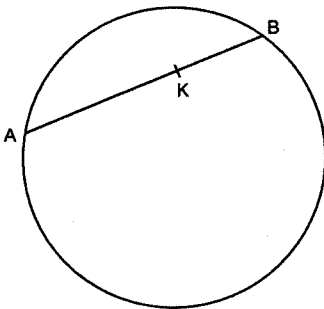
Şekilde verilen



$$|EG| \cdot |GK| = |DG| \cdot |GC|$$

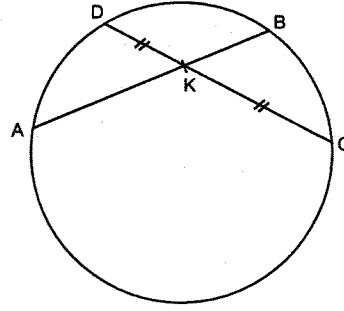
İç Kuvvet

Öğrencinin yapacağı



K noktasından geçen en kısa kiriş

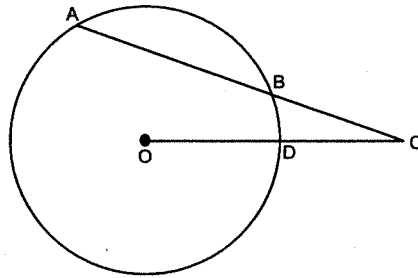
Şekilde verilen



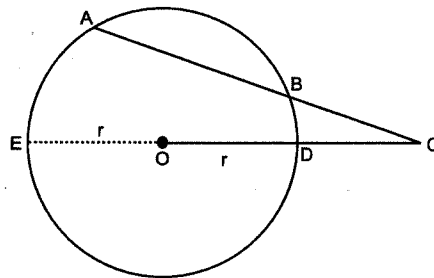
$$|DK| = |KC| \text{ dir. ve } |DK| = |KC| \text{ dir.}$$

$$|DK| \cdot |KC| = |AK| \cdot |KB| \text{ (İç Kuvvet)}$$

Öğrencinin yapacağı



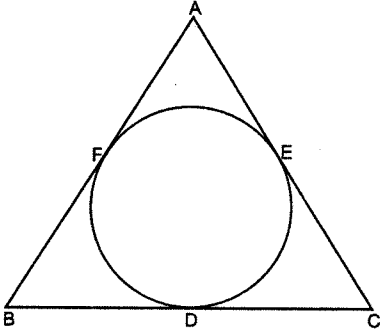
Şekilde verilen



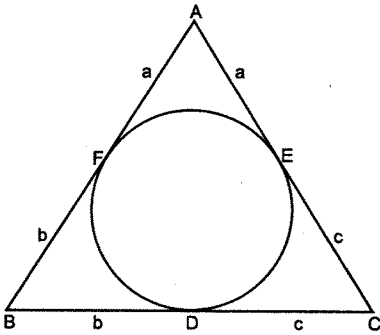
(Şimdi dış kuvvet yapabiliriz.)

Öğrencinin yapacağı

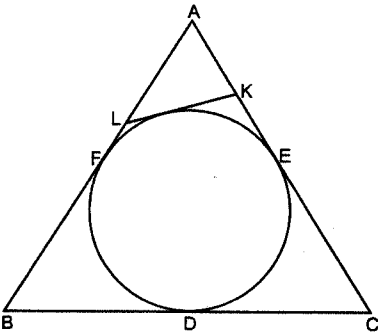
6. Çembere dışarıdan çizilen teğetler var ise teğet uzunlukları birbirine eşittir.



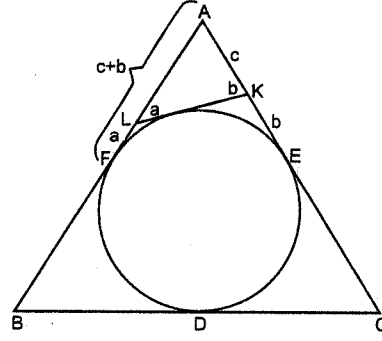
Şekilde verilen



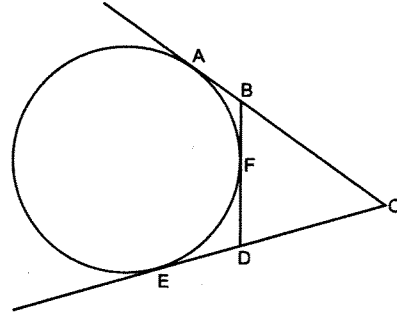
Öğrencinin yapacağı



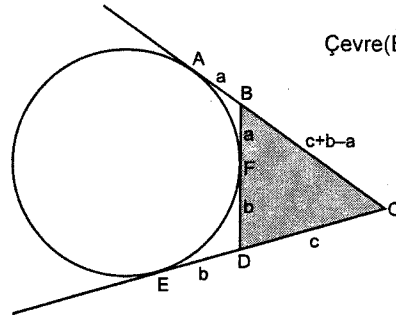
Şekilde verilen



Öğrencinin yapacağı

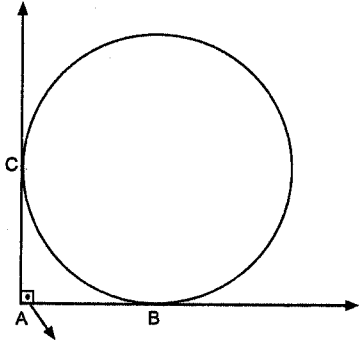


Şekilde verilen

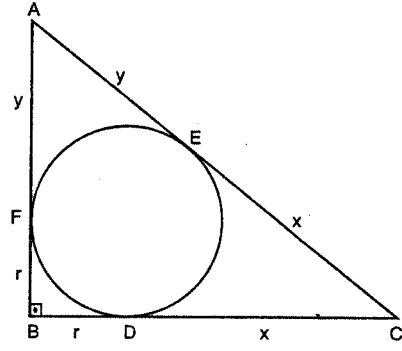


$$\begin{aligned}\widehat{\text{Çevre}}(\text{BDC}) &= 2b + 2c \\ &= 2|EC|\end{aligned}$$

Öğrencinin yapacağı

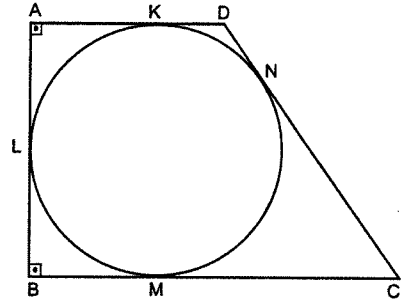
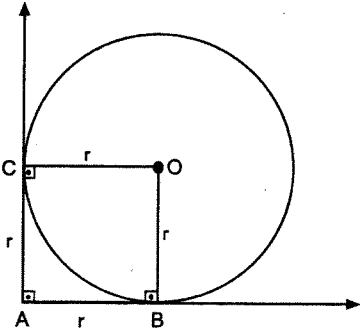


Açı 90° olduğu zaman $|AB|$ ve $|AC|$ yarıçapa eşittir.

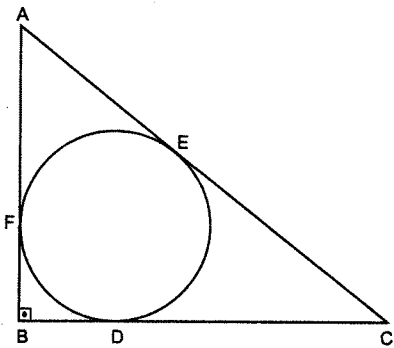


↗
Dikkat

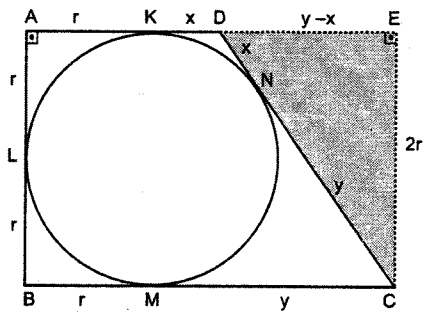
Öğrencinin yapacağı



Şekilde verilen

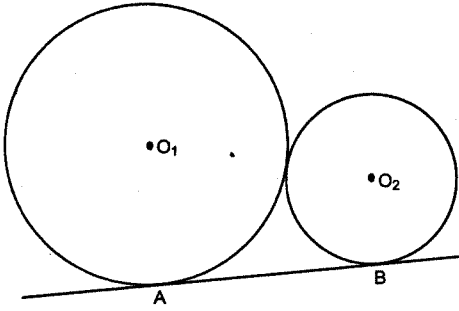


Şekilde verilen

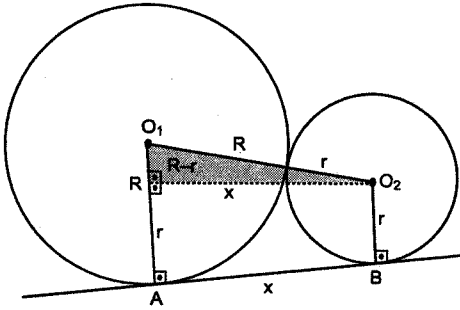


Öğrencinin yapacağı

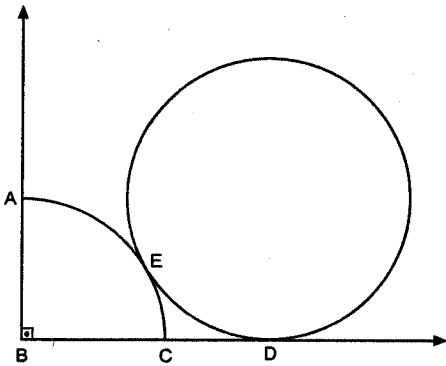
7. İki çember birbirine dıştan teğet ise çemberin merkezleri doğrusal olarak birleştirilir. Sonra merkezden teğete yarıçap çizilir. Ya dik üçgen ya da dik yamuk şekli çıkar. Bu şekiller yardımı ile soru çözülür.



Şekilde verilen

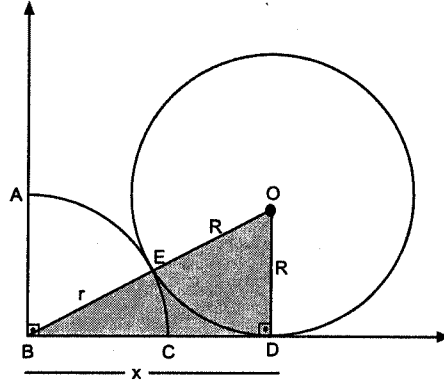


Öğrencinin yapacağı



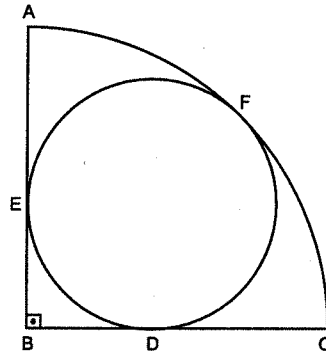
Şekilde verilen

Gibi

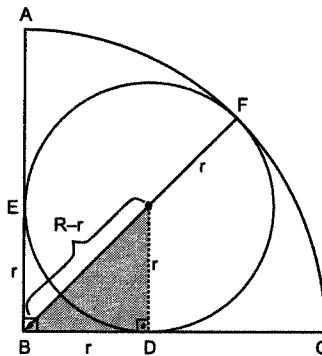


Öğrencinin yapacağı

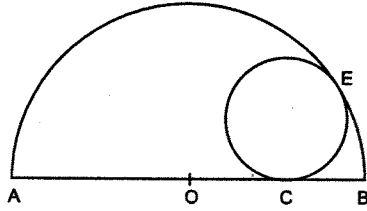
8. İki çember birbirine içten teğet ise çemberlerin merkezleri değme noktasına kadar doğrusal birleştirilir. Sonra içteki çemberden teğete dik indirilir. Sonra üçgen veya çıkan şekil yardımı ile soru çözülür.



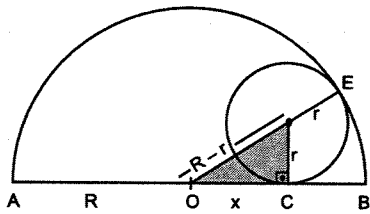
Şekilde verilen



Öğrencinin yapacağı



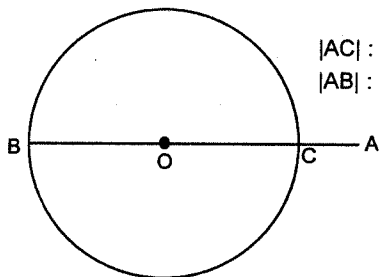
Şekilde verilen



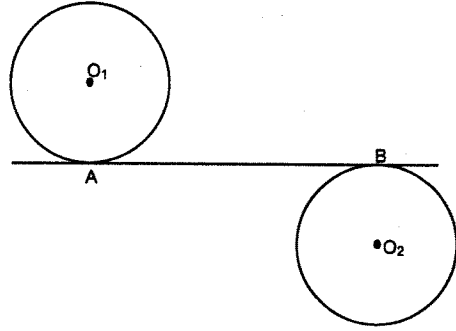
(Pisagor)

Öğrencinin yapacağı

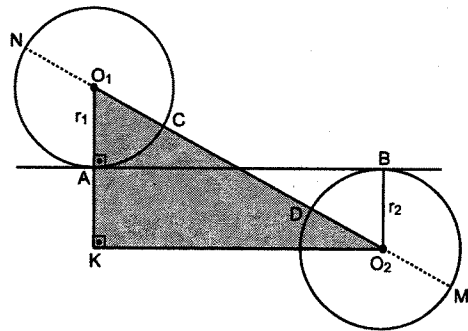
9. En kısa ve en uzun uzaklık şöyle bulunur. Bir soruda herhangi bir noktanın çembere en yakın ve en büyük uzaklık soruluyorsa bu noktadan çemberin merkezinden geçecek şekilde bir çizgi çizeriz.
- Bu noktanın çemberin başlangıç yerine olan uzaklığı en kısa, çemberin bitim yerine olan uzaklığı ise en büyük uzaklığı olur.



|AC| : en kısa uzaklık
|AB| : en büyük uzaklık



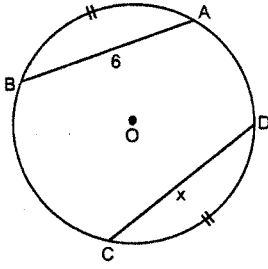
Şekilde verilen



Öğrencinin yapacağı

|CD| : en kısa uzaklık (çemberler arası)
(MN) : çemberler arası en büyük uzaklık

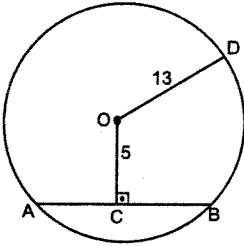
1.



$x = ?$

Cevap: 6

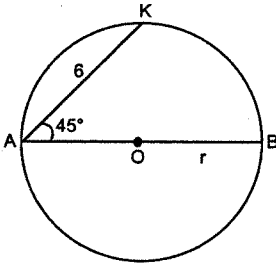
2.



$|AB| = ?$

Cevap: 24

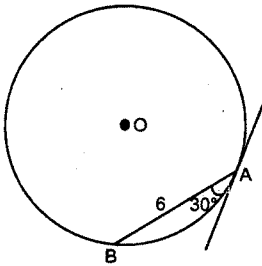
3.



$r = ?$

Cevap: $3\sqrt{2}$

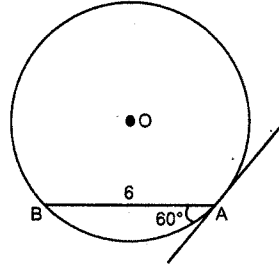
4.



$r = ?$

Cevap: 6

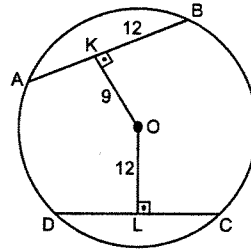
5.



$r = ?$

Cevap: $2\sqrt{3}$

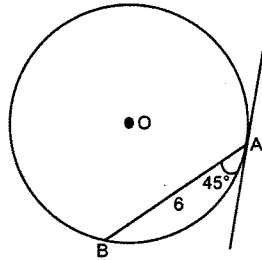
6.



$|DC| = ?$

Cevap: 18

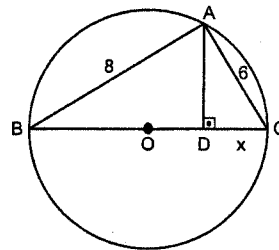
7.



$r = ?$

Cevap: $3\sqrt{2}$

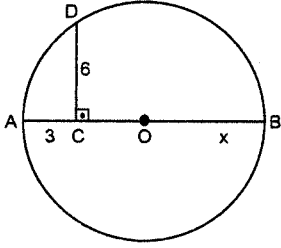
8.



$x = ?$

Cevap: 3,6

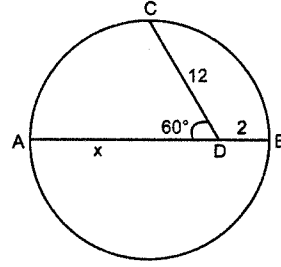
9.



$x = ?$

Cevap: 7,5

13.

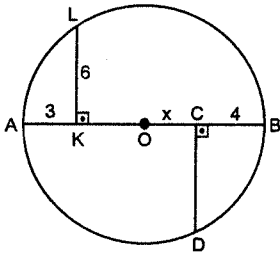


[AB] çap

$x = ?$

Cevap: $\frac{39}{2}$

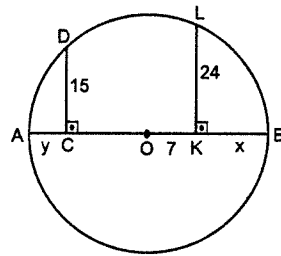
10.



$x = ?$

Cevap: $\frac{7}{2}$

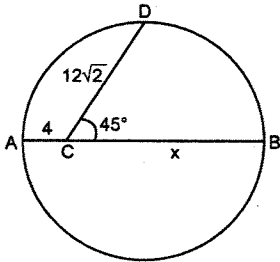
14.



$x - y = ?$

Cevap: 13

11.

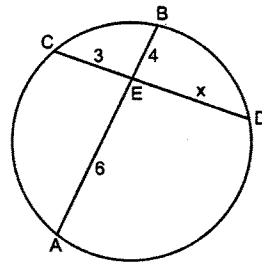


[AB] çap

$x = ?$

Cevap: 21

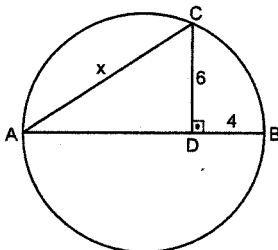
15.



$x = ?$

Cevap: 8

12.

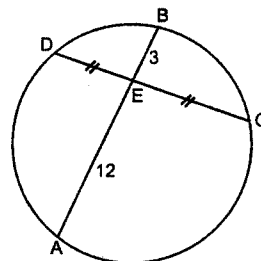


[AB] çap

$x = ?$

Cevap: $3\sqrt{13}$

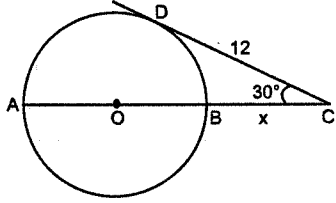
16.



|DC| = ?

Cevap: 12

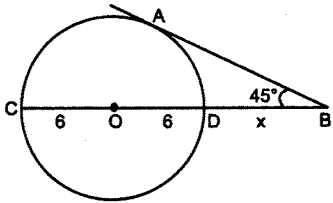
17.



$x = ?$

Cevap: $4\sqrt{3}$

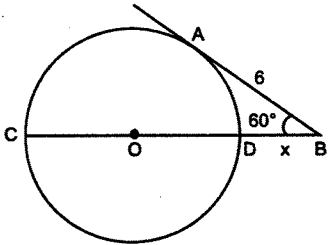
18.



$x = ?$

Cevap: $6\sqrt{2} - 6$

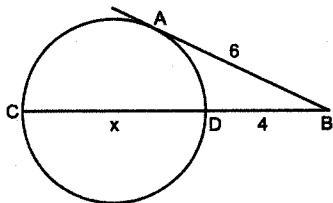
19.



$x = ?$

Cevap: $12 - 6\sqrt{3}$

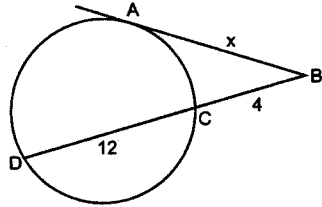
20.



$x = ?$

Cevap: 5

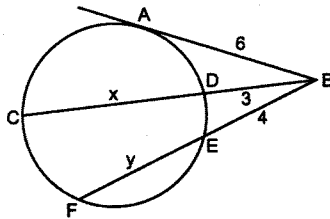
21.



$x = ?$

Cevap: 8

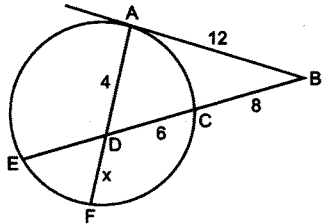
22.



$x - y = ?$

Cevap: 4

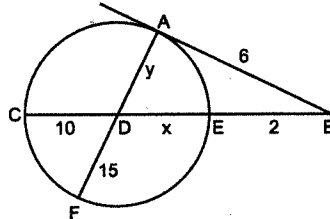
23.



$x = ?$

Cevap: 6

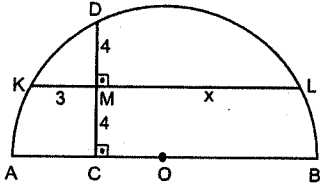
24.



$y + x = ?$

Cevap: 10

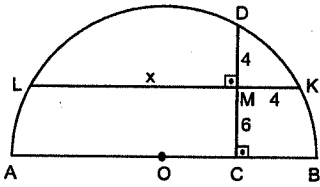
25.



$x = ?$

Cevap: 16

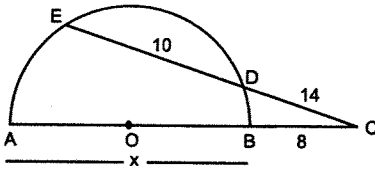
26.



$x = ?$

Cevap: 16

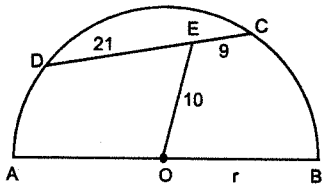
27.



$x = ?$

Cevap: 34

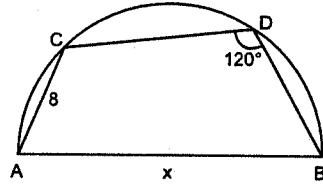
28.



$r = ?$

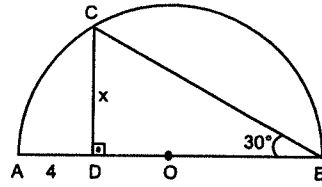
Cevap: 17

29.

 $|AB|$ çap $|AB| = ?$

Cevap: 16

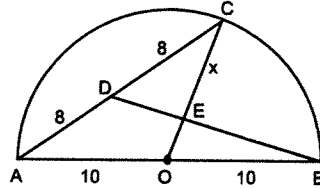
30.



$x = ?$

Cevap: $4\sqrt{3}$

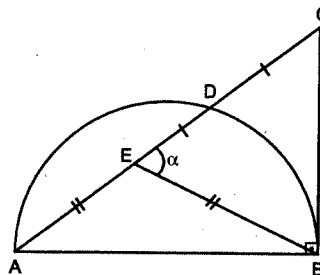
31.



$x = ?$

Cevap: $\frac{20}{3}$

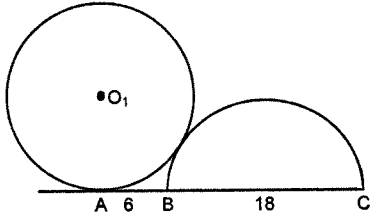
32.



$\alpha = ?$

Cevap: 60

33.

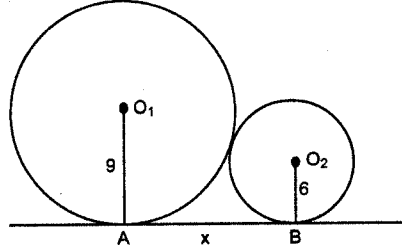


[BC] çap

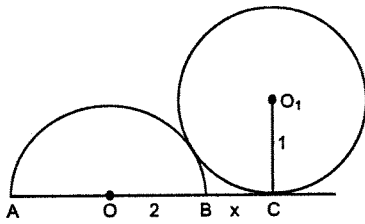
 $r_1 = ?$

Cevap: 8

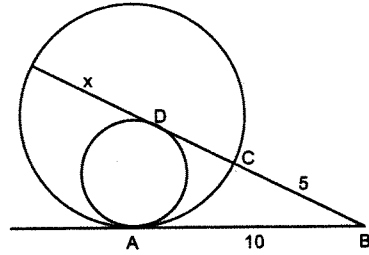
37.

 $x = ?$ Cevap: $6\sqrt{6}$

34.

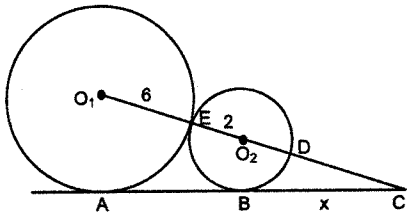
 $x = ?$ Cevap: $2\sqrt{2} - 2$

38.

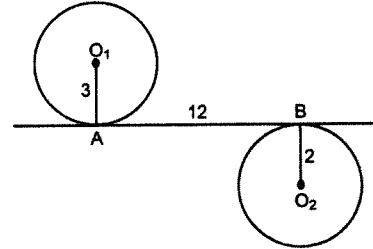
 $x = ?$

Cevap: 10

35.

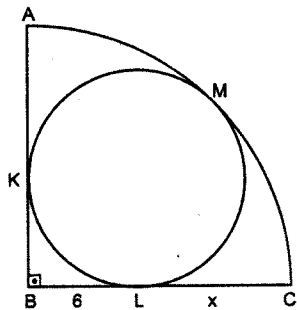
 $x = ?$ Cevap: $2\sqrt{3}$

39.

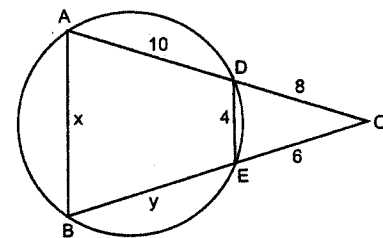
 $|O_1O_2| = ?$

Cevap: 13

36.

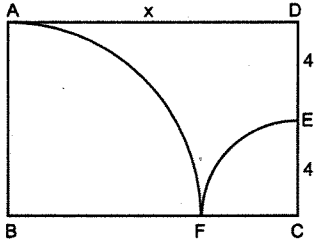
 $x = ?$ Cevap: $6\sqrt{2}$

40.

 $x + y = ?$

Cevap: 30

41.

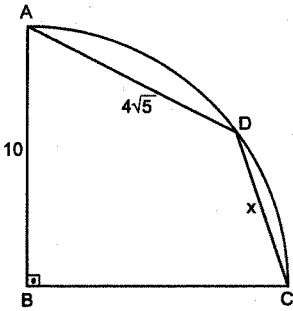


Dikdörtgen

$x = ?$

Cevap: 12

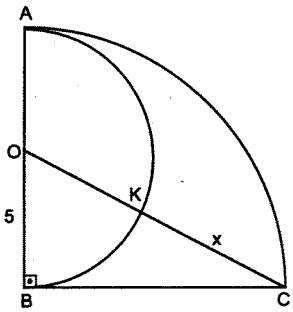
42.



$x = ?$

Cevap: $2\sqrt{10}$

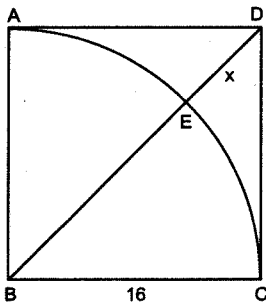
43.



$x = ?$

Cevap: $5\sqrt{5} - 5$

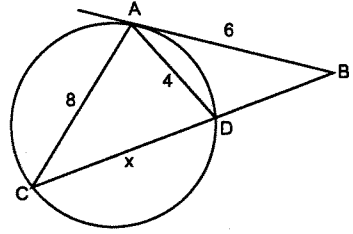
44.



$x = ?$

Cevap: $16\sqrt{2} - 16$

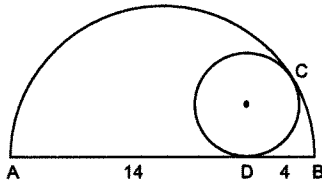
45.



$x = ?$

Cevap: 9

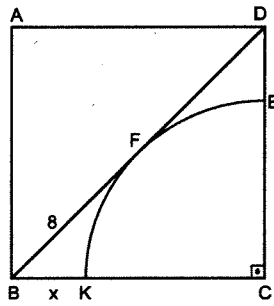
46.



$r = ?$

Cevap: $\frac{28}{9}$

47.

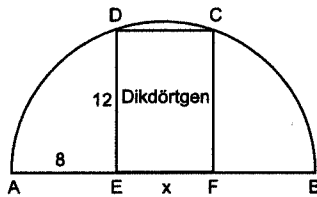


Kare;

$x = ?$

Cevap: $8\sqrt{2} - 8$

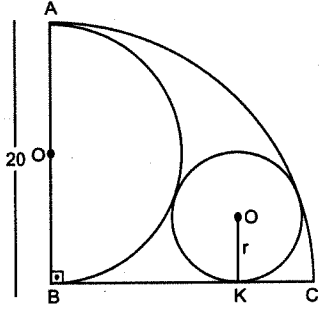
48.



$x = ?$

Cevap: 10

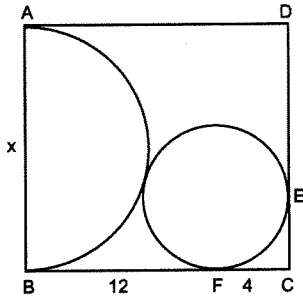
49.



$$r = ?$$

Cevap: 5

50.

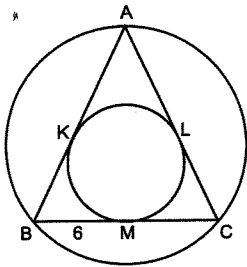


Dikdörtgen

$$x = ?$$

Cevap: 18

51.

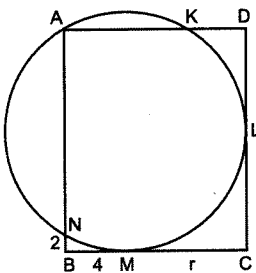


ABC eşkenar üçgen

$$R - r = ?$$

Cevap: $2\sqrt{3}$

52.

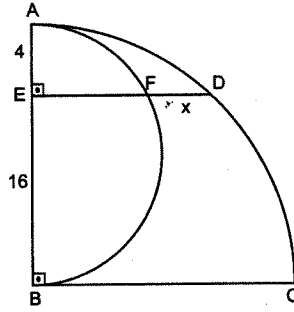


Dikdörtgen

$$r = ?$$

Cevap: 5

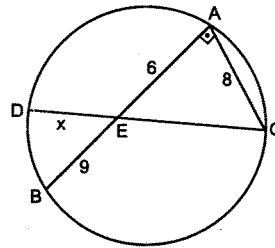
53.



$$x = ?$$

Cevap: 4

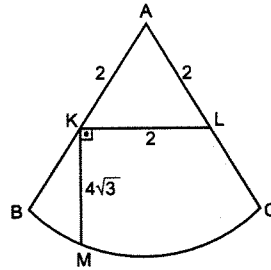
54.



$$x = ?$$

Cevap: 5,4

55.

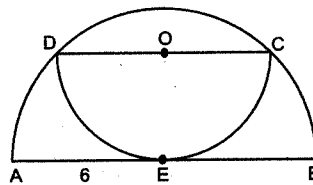


A merkezli çember yayı

$$r = ?$$

Cevap: $2\sqrt{19}$

56.

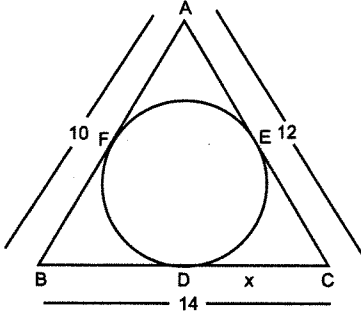


[AB] çap

$$|DC| = ?$$

Cevap: $6\sqrt{2}$

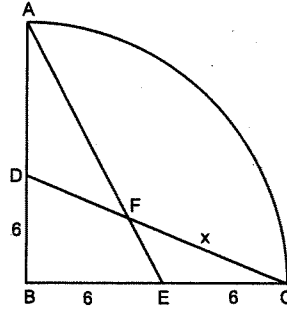
57.



$$x = ?$$

Cevap: 8

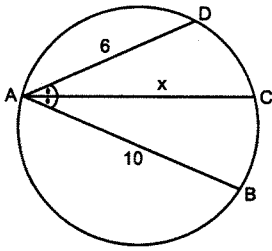
61.



$$x = ?$$

Cevap: $4\sqrt{5}$

58.

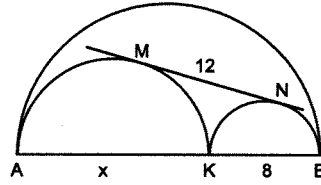


[AB] çap

$$x = ?$$

Cevap: $4\sqrt{5}$

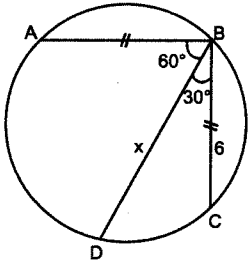
62.



$$x = ?$$

Cevap: 18

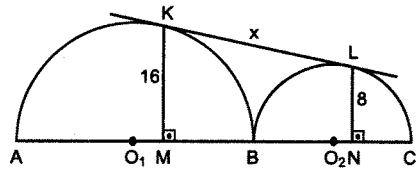
59.



$$x = ?$$

Cevap: $3\sqrt{3} + 3$

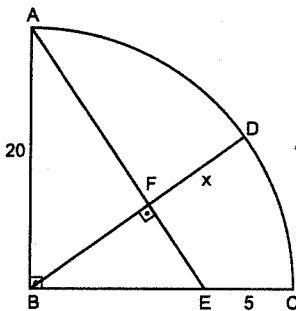
63.



$$x = ?$$

Cevap: 24

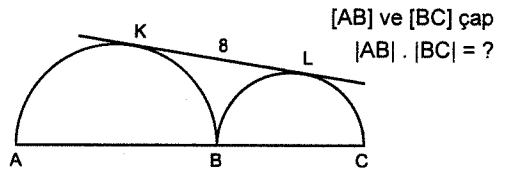
60.



$$x = ?$$

Cevap: 8

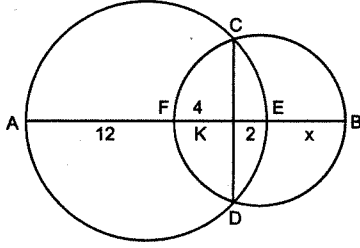
64.



[AB] ve [BC] çap
|AB| · |BC| = ?

Cevap: 64

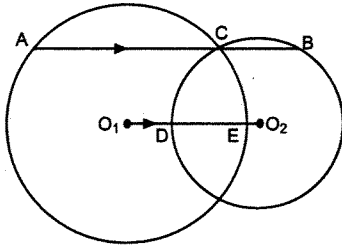
65.



$x = ?$

Cevap: 6

66.

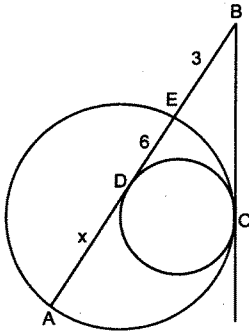


$|AB| = 16$

$|O_1O_2| = ?$

Cevap: 8

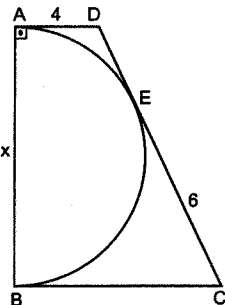
67.



$x = ?$

Cevap: 18

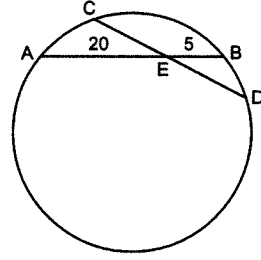
68.



$x = ?$

Cevap: $4\sqrt{6}$

69.

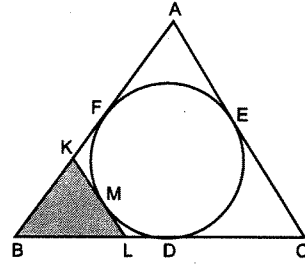


E noktasından geçen en kısa kiris [CD] ise

$|CD| = ?$

Cevap: 20

70.



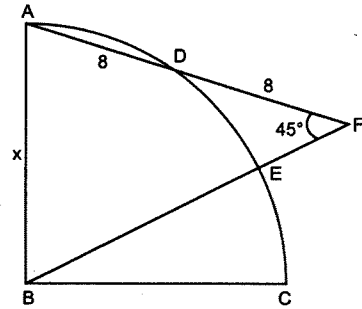
ABC eşkenar

$\widehat{C(ABC)} = 30$

$\widehat{C(BKL)} = ?$

Cevap: 10

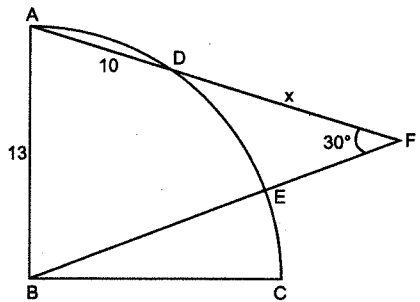
71.



$x = ?$

Cevap: $4\sqrt{10}$

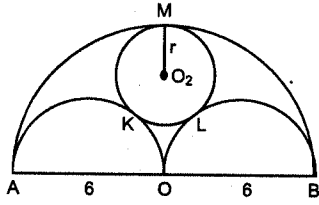
72.



$x = ?$

Cevap: $12\sqrt{3} - 5$

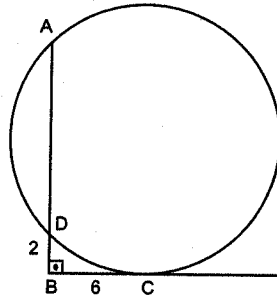
73.



$$r = ?$$

Cevap: 2

77.

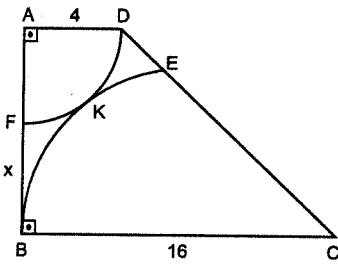


Çemberin yarıçapı

$$r = ?$$

Cevap: 10

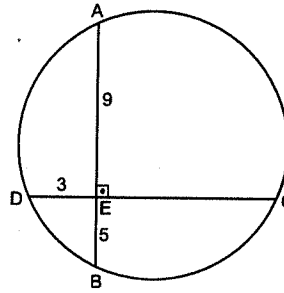
74.



$$x = ?$$

Cevap: 8

78.

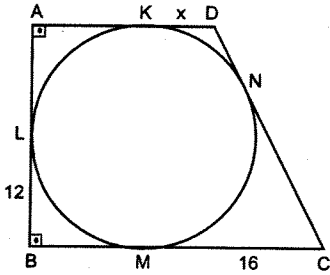


Çemberin yarıçapı

$$r = ?$$

Cevap: $\sqrt{85}$

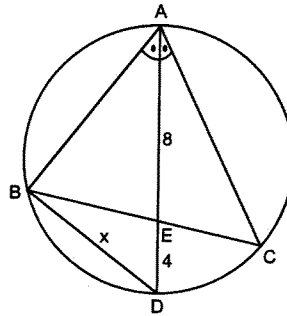
75.



$$x = ?$$

Cevap: 9

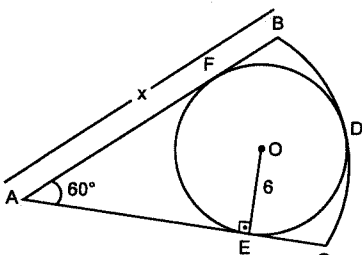
79.



$$x = ?$$

Cevap: $4\sqrt{3}$

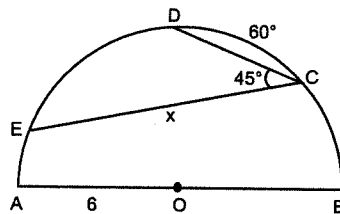
76.



$$x = ?$$

Cevap: 18

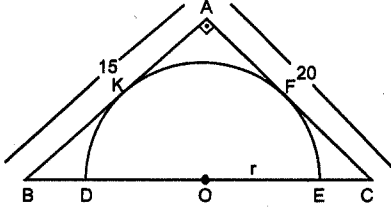
80.



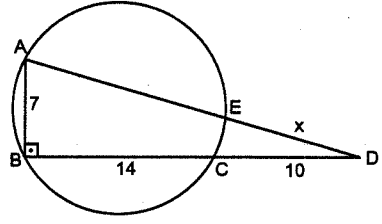
$$x = ?$$

Cevap: $3\sqrt{2} + 3\sqrt{6}$

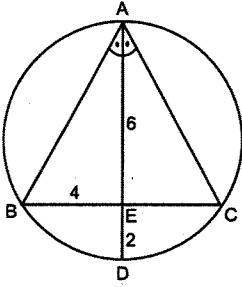
81.

 $r = ?$ Cevap: $\frac{60}{7}$

85.

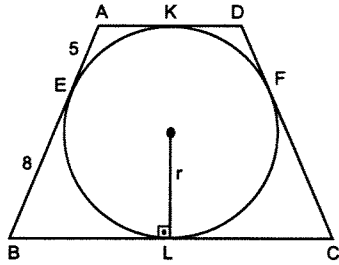
 $x = ?$ Cevap: $\frac{48}{5}$

82.

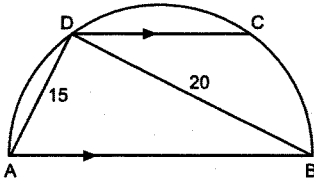
 $\widehat{\angle ABC} = ?$

Cevap: 21

86.

İkizkenar
yamuk $r = ?$ Cevap: $2\sqrt{10}$

83.

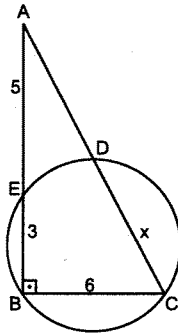


[AB] çap

 $|DC| = ?$

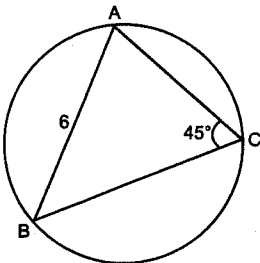
Cevap: 7

87.

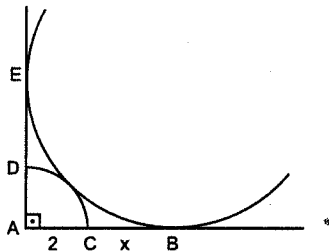
 $x = ?$

Cevap: 6

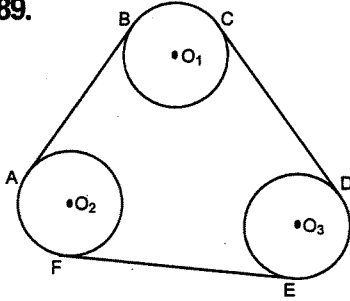
84.

Çemberin yarıçapı
kaçtır ?Cevap: $3\sqrt{2}$

88.

 $x = ?$ Cevap: $2\sqrt{2}$

89.



Eşçemberler

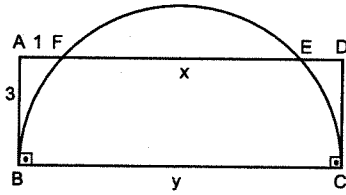
$$r = 3$$

$$\widehat{\angle(O_1 O_2 O_3)} = 12\pi$$

ipin çevresi

Cevap: 18π

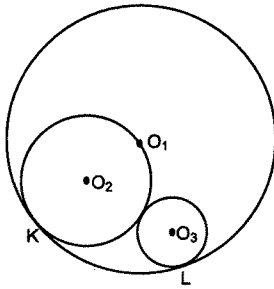
90.

ABCD
dikdörtgen

$$y - x = ?$$

Cevap: 2

91.



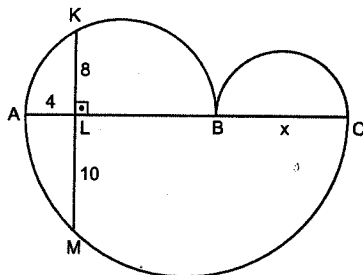
$$r_1 = 10$$

$$r_3 = 4$$

$$\widehat{\angle(O_1 O_2 O_3)} = ?$$

Cevap: 20

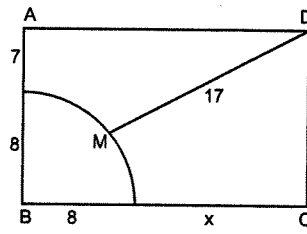
92.



$$x = ?$$

Cevap: 9

93.

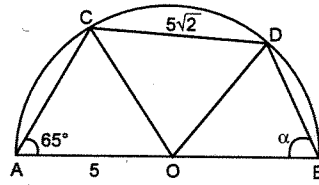
D noktasının
çembere en
yakın uzaklığı
M ise

$$|DM| = 17$$

$$x = ?$$

Cevap: 12

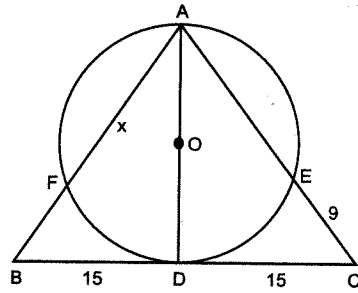
94.



$$\alpha = ?$$

Cevap: 70

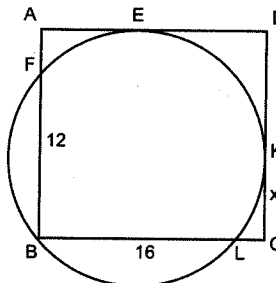
95.



$$x = ?$$

Cevap: 16

96.

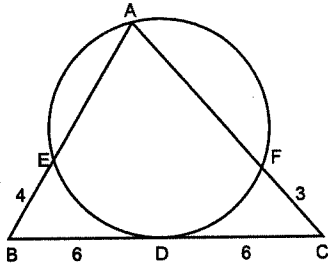


ABCD dikdörtgen

$$x = ?$$

Cevap: 6

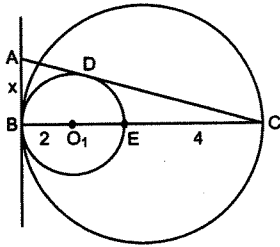
97.



$$\widehat{\angle ABC} = ?$$

Cevap: 33

98.

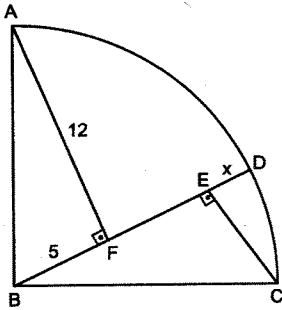


|BC| çap

$$x = ?$$

Cevap: $2\sqrt{2}$

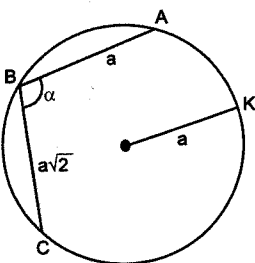
99.



$$x = ?$$

Cevap: 1

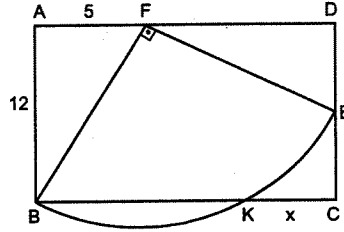
100.



$$\alpha = ?$$

Cevap: 105

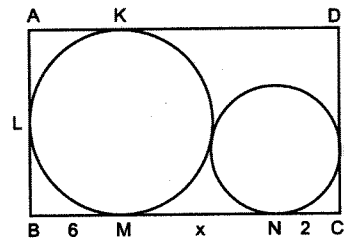
101.



$$x = ?$$

Cevap: 7

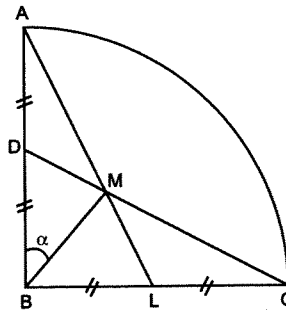
102.



$$x = ?$$

Cevap: $4\sqrt{3}$

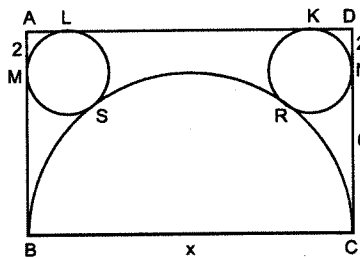
103.



$$\alpha = ?$$

Cevap: 45

104.

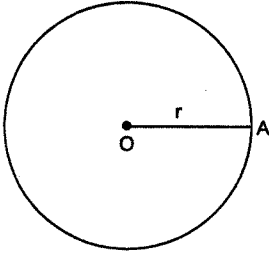


$$x = ?$$

Cevap: 9

DAİREDE ALAN

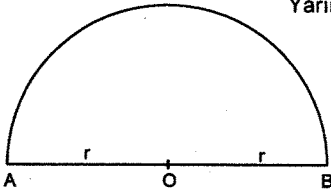
*



Dairenin Alanı : πr^2

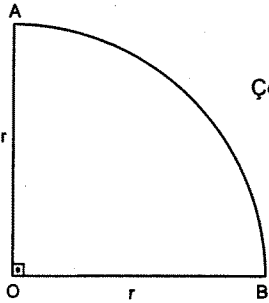
Çemberin çevresi: $2\pi r$

*



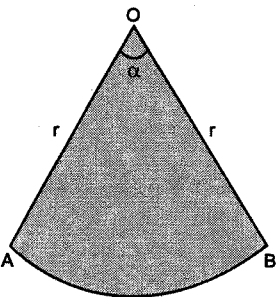
Yarım Dairenin Alanı: $\frac{\pi r^2}{2}$

*



Çeyrek Dairenin Alanı $\frac{\pi r^2}{4}$

*

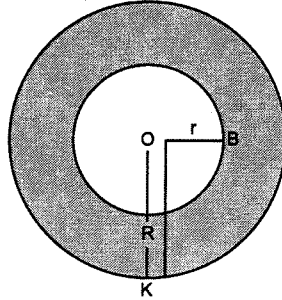


Taralı Alan = $\frac{\alpha}{360} \pi r^2$

$|\widehat{AB}| = \frac{\alpha}{360} \cdot 2\pi r$

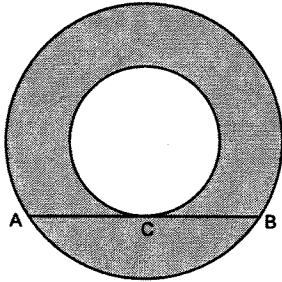
$$T.A = \frac{|\widehat{AB}| \cdot r}{2}$$

*



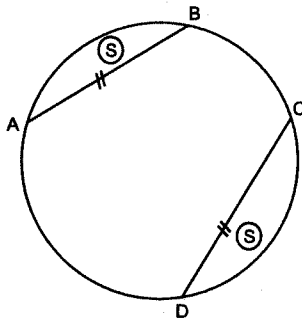
$T.A = \pi(R^2 - r^2)$

*



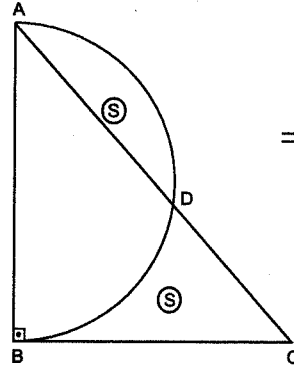
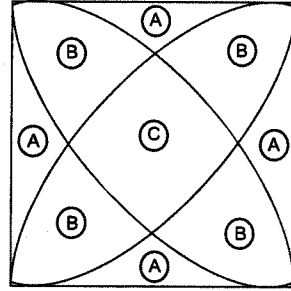
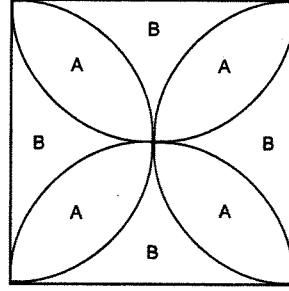
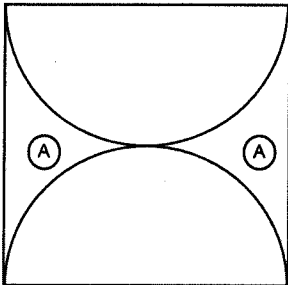
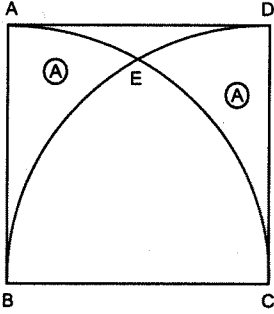
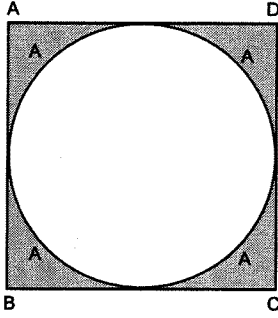
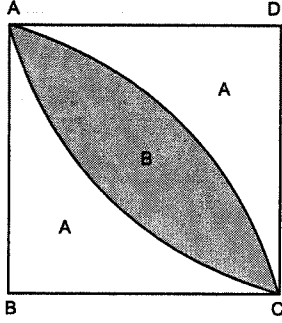
$T.A = \left(\frac{|AB|}{2}\right)^2 \pi$

*

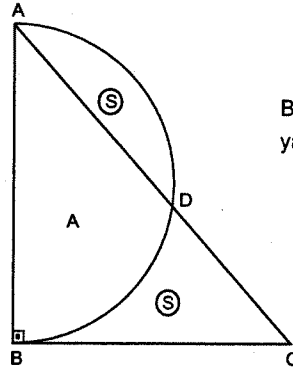


$|AB| = |DC| \Rightarrow$ Arkadaki Daire parçaları eşittir.

- Dairede alanda simetri şekiller çizilmişse eşit alanlara S, A, B gibi bulundukları yerleri harflendirin.



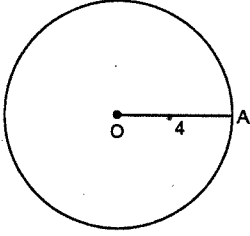
⇒ Alanlar eşit ise



Boş bulduğumuz yere A yazarak soruyu çözebiliriz.

Yarım Dairenin Alanı = $A(\widehat{ABC})$

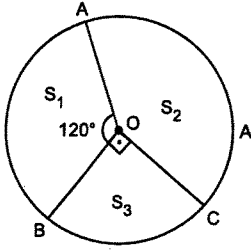
1.



Çevre = ?
Alan = ?

Çevre 8π
Alan 16π

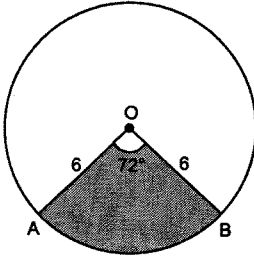
2.



$$\frac{S_1 + S_2}{S_3} = ?$$

Cevap: 3

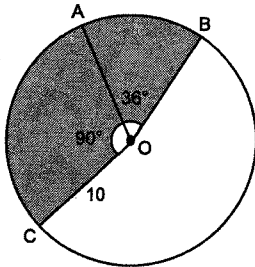
3.



T.A = ?

Cevap: $\frac{36\pi}{5}$

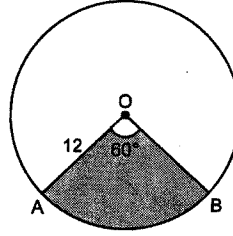
4.



T.A = ?

Cevap: 35π

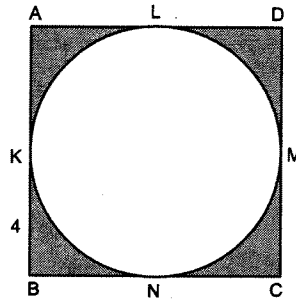
5.



T.A = ?

Cevap: 24π

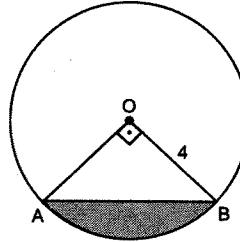
6.



T.A = ?

Cevap: $64 - 16\pi$

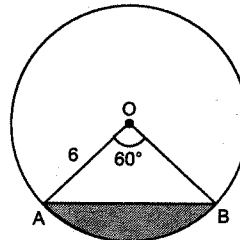
7.



T.A = ?

Cevap: $4\pi - 8$

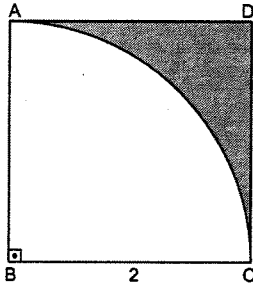
8.



T.A = ?

Cevap: $6\pi - 9\sqrt{3}$

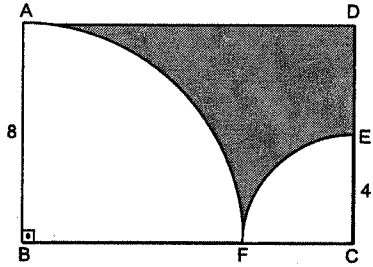
9.



T.A = ?

Cevap: $4 - \pi$

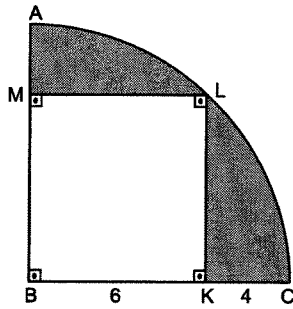
10.



T.A = ?

Cevap: $96 - 20\pi$

11.

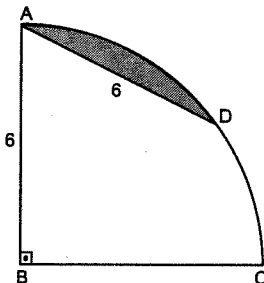


T.A = ?

MBKL dikdörtgen

Cevap: $25\pi - 48$

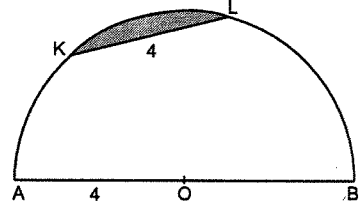
12.



T.A = ?

Cevap: $6\pi - 9\sqrt{3}$

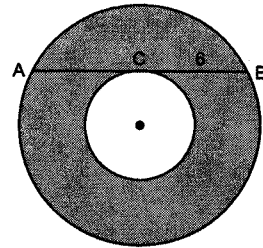
13.



T.A = ?

Cevap: $\frac{8\pi}{3} - 4\sqrt{3}$

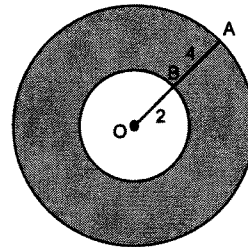
14.

 $|CB| = 6 \text{ cm}$

T. A = ?

Cevap: 36π

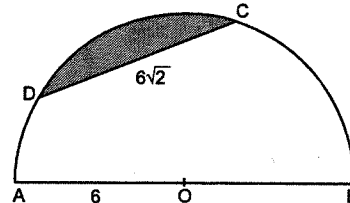
15.



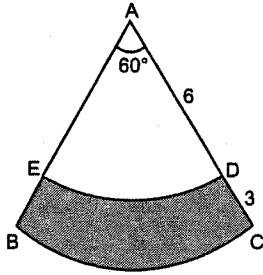
T.A = ?

 $|AB| = 4 \text{ cm}$ Cevap: 32π

16.

Cevap: $9\pi - 18$

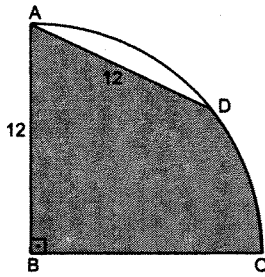
17.



T.A = ?

Cevap: $\frac{15\pi}{2}$

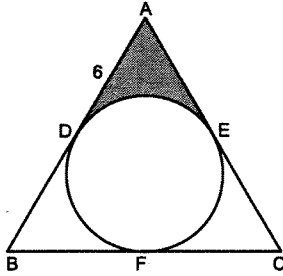
18.



T.A = ?

Cevap: $12\pi + 36\sqrt{3}$

19.

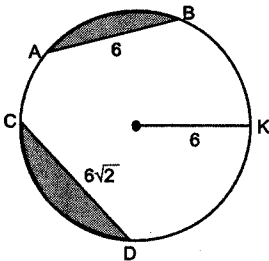


ABC eşkenar

T.A = ?

Cevap: $12\sqrt{3} - 4\pi$

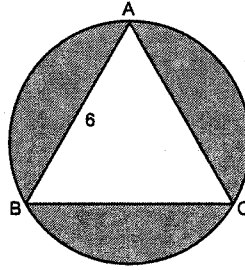
20.



T.A = ?

Cevap: $15\pi - 18 - 9\sqrt{3}$

21.

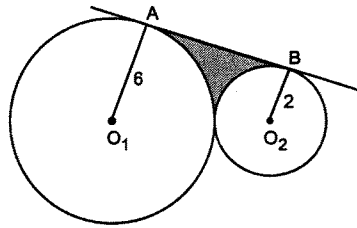


ABC eşkenar

T.A = ?

Cevap: $12\pi - 9\sqrt{3}$

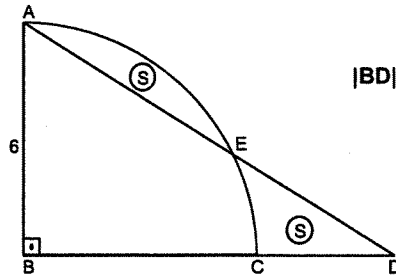
22.



T.A = ?

Cevap: $16\sqrt{3} - \frac{22\pi}{3}$

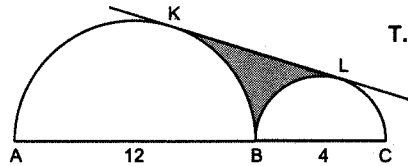
23.



|BD| = ?

Cevap: 3π

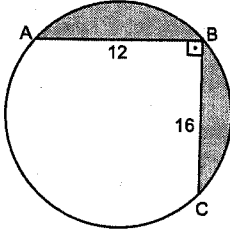
24.



T.A = ?

Cevap: $16\sqrt{3} - \frac{22\pi}{3}$

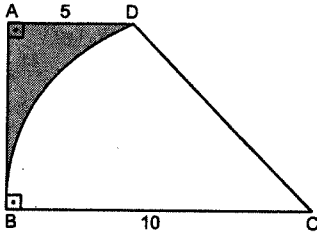
25.



T.A = ?

Cevap: $50\pi - 96$

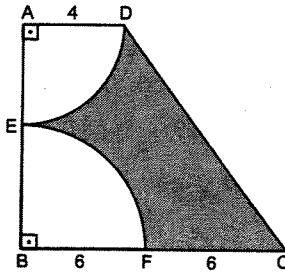
26.

C merkezli
çember yayı

T.A = ?

Cevap: $\frac{75\sqrt{3}}{2} - \frac{50\pi}{3}$

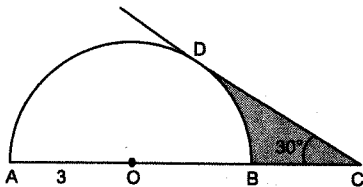
27.



T.A = ?

Cevap: $80 - 13\pi$

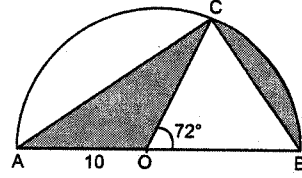
28.



T.A = ?

Cevap: $\frac{9\sqrt{3}}{2} - \frac{3\pi}{2}$

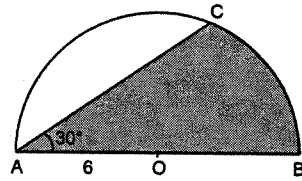
29.



T.A = ?

Cevap: 20π

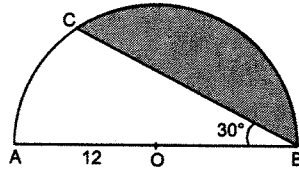
30.



T.A = ?

Cevap: $6\pi + 9\sqrt{3}$

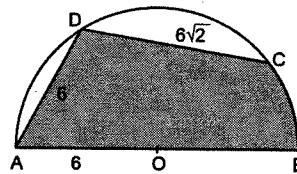
31.



T.A = ?

Cevap: $48\pi - 36\sqrt{3}$

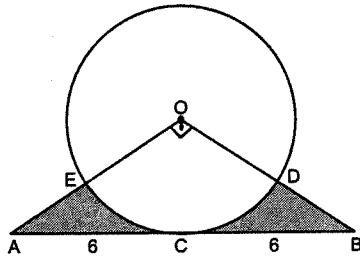
32.



T.A = ?

Cevap: $3\pi + 18 + 9\sqrt{3}$

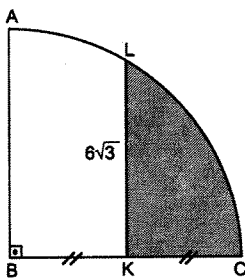
33.



T.A = ?

Cevap: $36 - 9\pi$

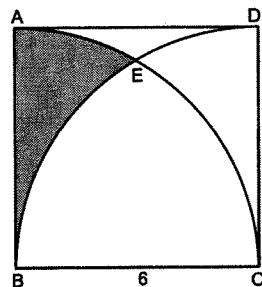
34.



T.A = ?

Cevap: $24\pi - 18\sqrt{3}$

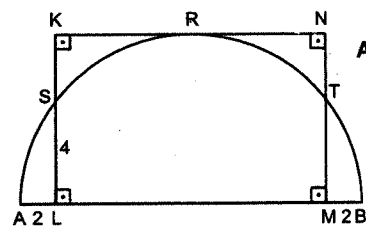
35.



T.A = ?

Cevap: $9\sqrt{3} - 3\pi$

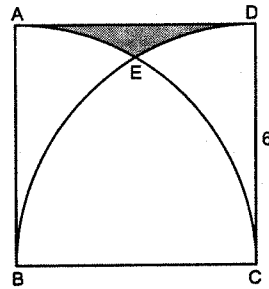
36.



A(KLMN) = ?

Cevap: 30

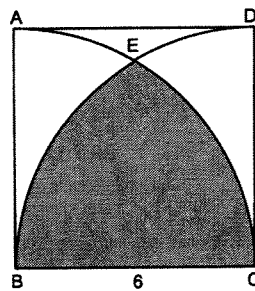
37.



T.A = ?

Cevap: $36 - 6\pi - 9\sqrt{3}$

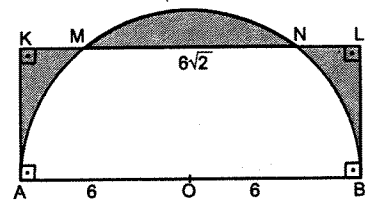
38.



T.A = ?

Cevap: $12\pi - 9\sqrt{3}$

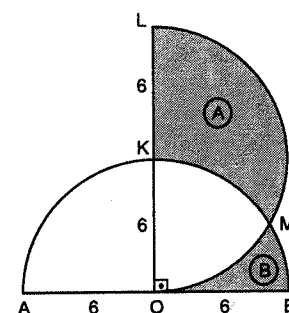
39.



T.A = ?

Cevap: $36\sqrt{2} - 36$

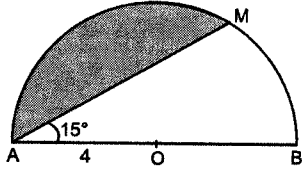
40.



A - B = ?

Cevap: 9π

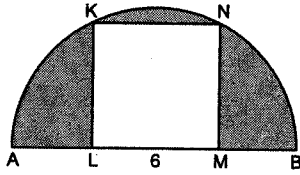
41.



T.A = ?

$$\text{Cevap: } \frac{20\pi}{3} - 4$$

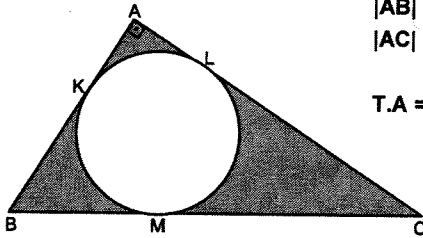
42.



KLMN Kare

$$\text{Cevap: } \frac{45\pi}{2} - 36$$

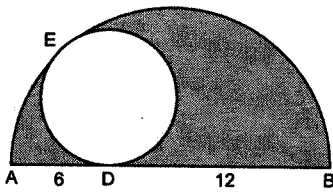
43.


 $|AB| = 5$
 $|AC| = 12$

T.A = ?

$$\text{Cevap: } 30 - 4\pi$$

44.

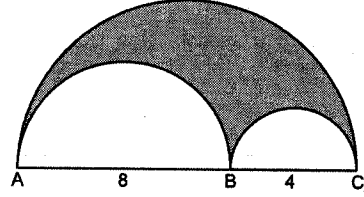


[AB] çap

T.A = ?

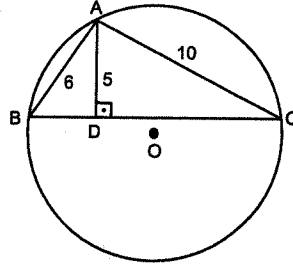
$$\text{Cevap: } \frac{49\pi}{2}$$

45.


 $T.A = ?$
 [AB] ve [BC]
 çap

$$\text{Cevap: } 8\pi$$

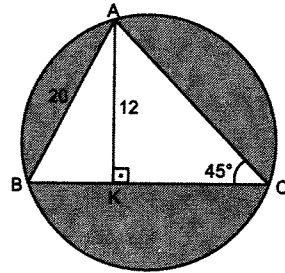
46.



Dairenin alanı ?

$$\text{Cevap: } 36\pi$$

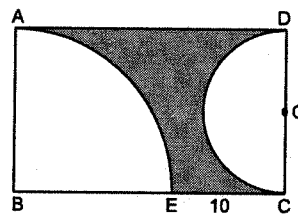
47.



T.A = ?

$$\text{Cevap: } 200\pi - 168$$

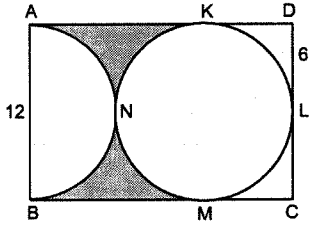
48.


 Daireler arası
 en kısa uzunluk
 4 cm ise

T.A = ?

$$\text{Cevap: } 336 - \frac{147\pi}{2}$$

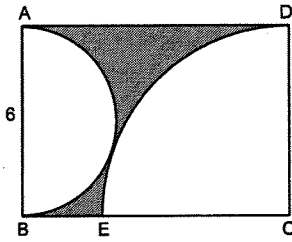
49.

ABCD
dikdörtgen

T.A = ?

Cevap: $144 - 36\pi$

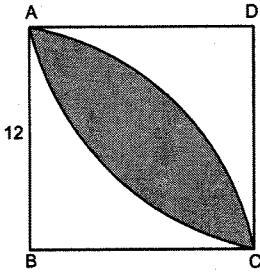
50.



T.A = ?

ABCD
dikdörtgenCevap: $36\sqrt{2} - \frac{27\pi}{2}$

51.

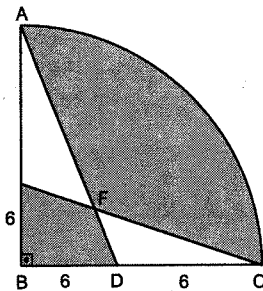


T.A = ?

ABCD kare

Cevap: $72\pi - 144$

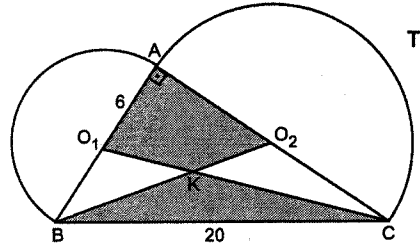
52.



T.A = ?

Cevap: $36\pi - 24$

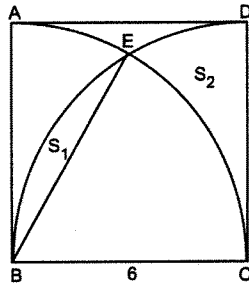
53.



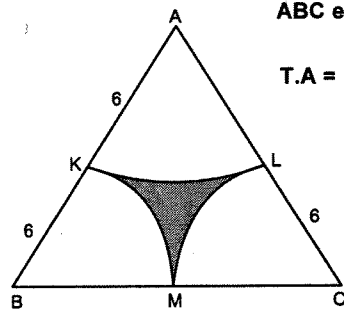
T.A = ?

Cevap: 64

54.

 $S_2 - S_1 = ?$ Cevap: $18\sqrt{3} - 9\pi$

55.

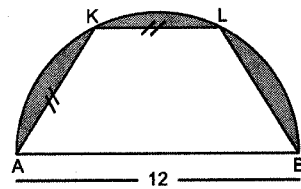


ABC eşkenar üçgen

T.A = ?

Cevap: $36\sqrt{3} - 18\pi$

56.

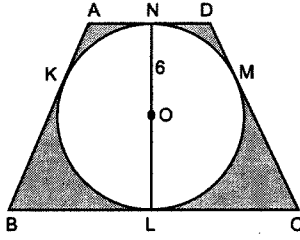
İkizkenar
yamuk

[AB] çap

T.A = ?

Cevap: $18\pi - 27\sqrt{3}$

57.

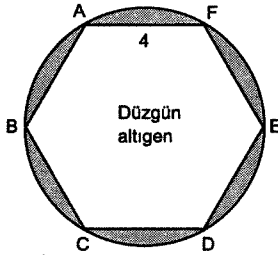


İkizkenar
yamuk
Ortataban = 20 cm
ise

T.A = ?

Cevap: $240 - 36\pi$

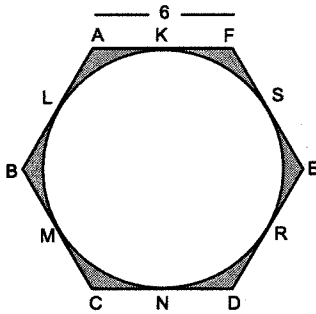
58.



T.A = ?

Cevap: $16\pi - 24\sqrt{3}$

59.

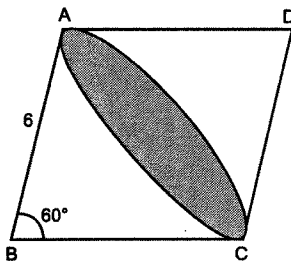


Düzgün altıgen

T.A = ?

Cevap: $54\sqrt{3} - 27\pi$

60.

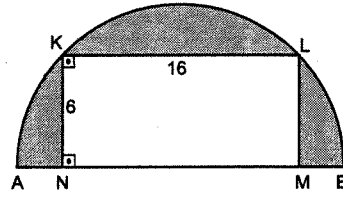


Paralelkenar

T.A = ?

Cevap: $12\pi - 18\sqrt{3}$

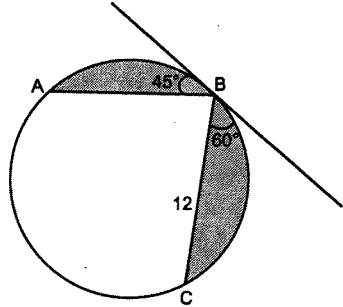
61.



T.A = ?

Cevap: $50\pi - 96$

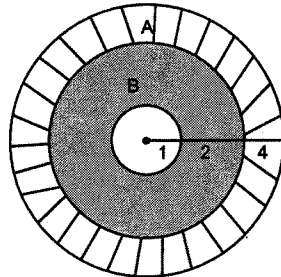
62.



T.A = ?

Cevap: $28\pi - 24 - 12\sqrt{3}$

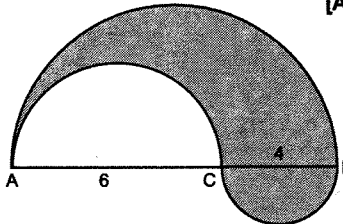
63.



A - B = ?

Cevap: 32π

64.

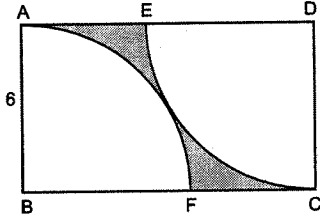


[AC] ve [BC] çap

T.A = ?

Cevap: 10π

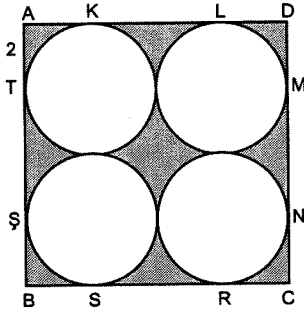
65.



T.A = ?

Cevap: $36\sqrt{3} - 18\pi$

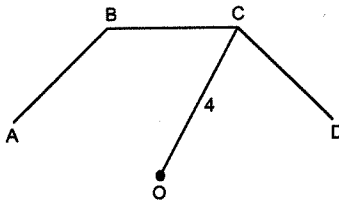
66.

Eş daireler
ABCD kare

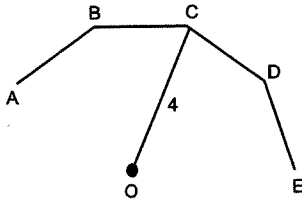
T.A = ?

Cevap: $64 - 16\pi$

67.

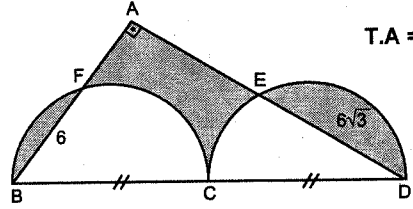
Düzgün
sekizgenin
alanı ?O ağırlık
merkeziCevap: $32\sqrt{2}$

68.

Düzgün
onikigenin
alanı ?O ağırlık
merkezi

Cevap: 48

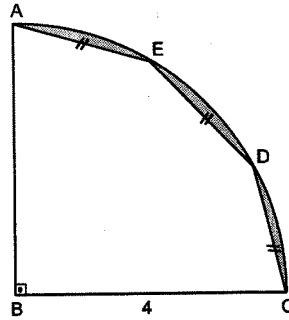
69.



T.A = ?

Cevap: $36\sqrt{3}$

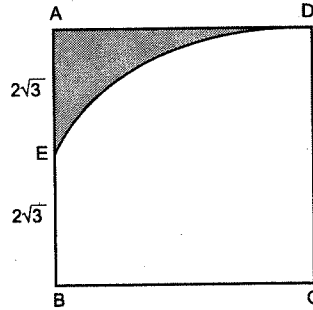
70.



T.A = ?

Cevap: $4\pi - 12$

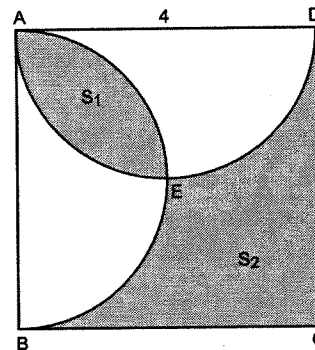
71.

C merkezli daire
dilimi

ABCD dikdörtgen

Cevap: $18\sqrt{3} - 8\pi$

72.



ABC kare

 $S_1 + S_2 = ?$

Cevap: 8

TRİGONOMETRİ

BÖLÜM – I

Açı ölçü çeşitleri:

Derece , Radyan , Grad
(D) (R) (G)

Esas Ölçünün Bulunuşu:

- a) Pozitif yönlü açıların esas ölçülerinin bulunuşu açı derece cinsinden verilmişse 360° nin katları, Radyan cinsinden verilmişse 2π nin katları atılarak bulunur.
- b) Negatif yönlü açıların esas ölçülerinin bulunuşu açı pozitifmiş gibi esas ölçü bulunur ve bulunan değer, derece cinsinden ise 360° den radyan cinsinden ise 2π den çıkarılarak bulunur.

Örnek: 3270° nin esas ölçüsü?

$$\begin{array}{r} 3270 \overline{) 360} \\ \underline{30} \end{array} \quad \text{esas ölçüsü } 30^\circ \text{ dir.}$$

Örnek: -3270° nin esas ölçüsü?

$$\begin{array}{r} 3270 \overline{) 360} \\ \underline{3240} \end{array} \quad 360 - 30 \text{ esas ölçüsü } 330^\circ \text{ dir.}$$

Örnek: $64 \frac{\pi}{7}$ nin esas ölçüsü?

paydanın 2 katı alınır. Paya bölünür.

$$\begin{array}{r} 64 \overline{) 14} \\ \underline{56} \end{array} \quad \text{esas ölçüsü } \frac{8\pi}{7}$$

$$4.2\pi + \frac{8\pi}{7} = \frac{64\pi}{7}$$

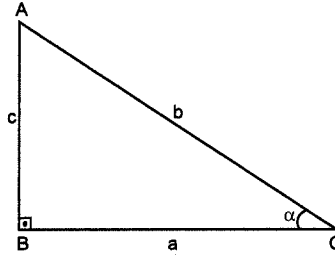
Örnek: $\frac{113\pi}{5}$ nin esas ölçüsü?

paydanın 2 katı alınır. Paya bölünür.

$$\begin{array}{r} 113 \overline{) 10} \\ \underline{110} \end{array} \quad \text{esas ölçüsü } \frac{3\pi}{5}$$

$$\frac{113\pi}{5} = 11.2\pi + \frac{3\pi}{5}$$

Dik Üçgende Trigonometri Bağlılıları:



α açısı için;
Karşı dik kenar $\rightarrow c$
Komşu dik kenar $\rightarrow a$
Hipotenüs $\rightarrow b$

$$\text{Sinüs} \rightarrow \frac{\text{Karşı dik kenar}}{\text{Hipotenüs}} = \frac{c}{b}$$

$$\text{Cosinüs} \rightarrow \frac{\text{Komşu dik kenar}}{\text{Hipotenüs}} = \frac{a}{b}$$

$$\text{Tanjant} \rightarrow \frac{\text{Karşı dik kenar}}{\text{Komşu dik kenar}} = \frac{c}{a}$$

$$\left(\frac{\sin \alpha}{\cos \alpha} \right)$$

$$\text{Cotanjant} \rightarrow \frac{\text{Komşu dik kenar}}{\text{Karşı dik kenar}} = \frac{a}{c}$$

$$\left(\frac{\cos \alpha}{\sin \alpha} \right)$$

$$\text{Secant} \rightarrow \frac{1}{\cos x} \quad \text{Cosecx} = \frac{1}{\sin x}$$

➤ Birbirini 90° ye tamamlayan açıların sinüsü, cosinüsüne, cotanjantına, tanjantına eşittir.

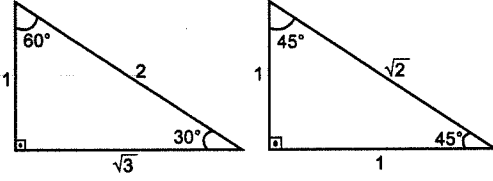
$$\begin{array}{ll} \sin x = \cos(90-x) & \text{Örnek: } \sin 30 = \cos 60 \\ \cos x = \sin(90-x) & \cos 70 = \sin 20 \\ \cot x = \tan(90-x) & \tan 40 = \cot 50 \\ \tan x = \cot(90-x) & \cot 25 = \tan 65 \end{array}$$

$$\text{Örnek: } x + y = 90^\circ \Rightarrow \tan x = \cot y$$

$$\text{Örnek: } 7x = \frac{\pi}{2}$$

$$\begin{array}{l} \sin 4x = \cos 3x \\ \tan 2x = \cot 5x \text{ gibi.} \end{array}$$

Dik Üçgende Bazı Özel Açıların Trigonometrik Değerleri:



$$\sin 30 = \frac{1}{2} = \cos 60$$

$$\sin 60 = \frac{\sqrt{3}}{2} = \cos 30$$

$$\tan 30 = \frac{1}{\sqrt{3}} = \cot 60$$

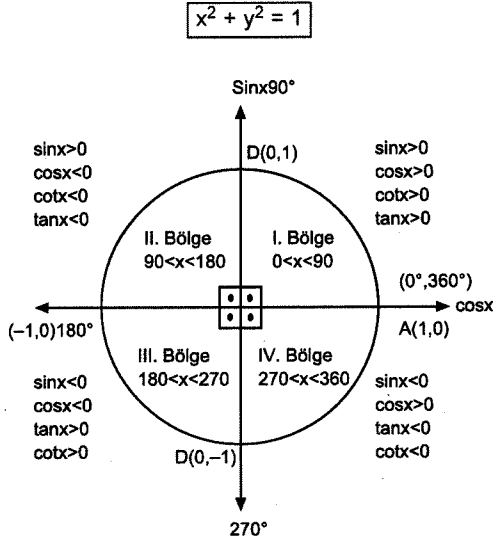
$$\tan 45 = 1 = \cot 45$$

$$\tan 60 = \sqrt{3} = \cot 30$$

$$\cos 45 = \sin 45 = \frac{\sqrt{2}}{2}$$

BİRİM ÇEMBER

Merkezi orjin, yarıçapı 1 br olan çembere birim çember denir.



$$\sin 0 = 0$$

$$\cos 0 = 1$$

$$\tan 0 = 0$$

$$\cot 0 = +\infty$$

$$\sin 180 = 0$$

$$\cos 180 = -1$$

$$\tan 180 = 0$$

$$\cot 180 = -\infty$$

$$\sin 90 = 1$$

$$\cos 90 = 0$$

$$\tan 90 = +\infty$$

$$\cot 90 = 0$$

$$\sin 270 = -1$$

$$\cos 270 = 0$$

$$\tan 270 = -\infty$$

$$\cot 270 = 0$$

Çok önemli: Sinüs, cosinüs, tanjant ve Cot'ın içindeki açılar 90° den büyük ise bu açıların değeri dar açı cinsinden hesap edilmelidir.

Öncelikle parantez içindeki ifade birim çemberde kaçın-
cı bölgeye denk geldiği bulunur. Bu bölgede işareti ne
ise yazılır. Sonra α nın solundaki (yanındaki) ifade 90°
nın tek katları ise $\sin \rightarrow \cos$ 'a dönüşür.

$\cos \rightarrow \sin$ 'e $\tan \rightarrow \cot$ 'a $\cot \rightarrow \tan$ 'a

trigonometrik değerlerinin bilinmesi ile sonuç bulunur.

➤ 90° nın çift katlarında dönüşüm olmaz.

$$\sin(90+x) = +\cos x$$

2. bölge

$$\sin(180+x) = -\sin x$$

3. bölge

$$\sin\left(\frac{\pi}{2}-x\right) = \cos x$$

1. bölge

$$\sin\left(\frac{\pi}{2}+x\right) = +\cos x$$

2. bölge

$$\sin(\pi-x) = +\sin x$$

2. bölge

$$\sin(\pi+x) = -\sin x$$

3. bölge

$$\sin\left(3\frac{\pi}{2}-x\right) = -\cos x$$

3. bölge

$$\sin\left(3\frac{\pi}{2}+x\right) = -\cos x$$

4. bölge

$$\sin(3\pi-x) = +\sin x$$

2. bölge

$$\sin(2\pi-x) = -\sin x$$

4. bölge

$$\sin(2\pi+x) = +\sin x$$

1. bölge

$$\tan\left(\frac{\pi}{2}-x\right) = \cot x$$

1. bölge

$$\tan\left(\frac{\pi}{2}+x\right) = -\cot x$$

2. bölge

$$\tan(\pi-x) = -\tan x$$

2. bölge

$$\tan(\pi+x) = +\tan x$$

3. bölge

$$\tan\left(\frac{3\pi}{2}-x\right) = +\cot x$$

3. bölge

$$\tan\left(\frac{3\pi}{2}+x\right) = -\cot x$$

4. bölge

$$\tan(2\pi-x) = -\tan x$$

4. bölge

$$\tan(2\pi+x) = \tan x$$

1. bölge

$$\tan(270-x) = +\cot x$$

3. bölge

$$\cot(360-x) = -\cot x \text{ gibi}$$

4. bölge

$$\cos\left(\frac{\pi}{2}+x\right) = -\sin x$$

2. bölge

$$\cos\left(\frac{\pi}{2}-x\right) = \sin x$$

1. bölge

$$\cos(\pi-x) = -\cos x$$

2. bölge

$$\cos(\pi+x) = -\cos x$$

3. bölge

$$\cos\left(3\frac{\pi}{2}-x\right) = -\sin x$$

3. bölge

$$\cos\left(3\frac{\pi}{2}+x\right) = +\sin x$$

4. bölge

$$\cos(3\pi+x) = -\cos x$$

3. bölge

$$\cos(2\pi-x) = +\cos x$$

4. bölge

$$\cos(2\pi+x) = +\cos x$$

1. bölge

$$\cot\left(\frac{\pi}{2}-x\right) = \tan x$$

1. bölge

$$\cot\left(\frac{\pi}{2}+x\right) = -\tan x$$

2. bölge

$$\cot(\pi-x) = -\cot x$$

2. bölge

$$\cot(\pi+x) = +\cot x$$

3. bölge

$$\cot\left(\frac{3\pi}{2}-x\right) = +\tan x$$

3. bölge

$$\cot(2\pi-x) = -\cot x$$

4. bölge

$$\cot(2\pi+x) = +\cot x$$

1. bölge

Örnek:

$$\sin\left(\frac{\pi}{2} - x\right) + \cos\left(\frac{3\pi}{2} - x\right) + \tan(2\pi - x) + \cot\left(\frac{3\pi}{2} - x\right) = ?$$

Cevap: $\cos x - \sin x$

Örnek:

$$\frac{\sin(90+x) + \cos(270+x) + \sin(270-x)}{\sin(2\pi-x) - \cos\left(\frac{\pi}{2} + x\right) - \sin(90-x)} = ?$$

Cevap: $-\tan x$

Örnek:

$$\tan(\pi+x) - \cot(\pi-x) + \tan\left(\frac{3\pi}{2} + x\right) - \cot(2\pi-x) = ?$$

Cevap: $\tan x + \cot x$

Örnek:

$$\frac{\tan(2\pi-x)}{\cot(\pi+x) - \tan\left(\frac{3\pi}{2} - x\right) - \cot\left(\frac{3\pi}{2} - x\right)} = ?$$

Cevap: 1

Örnek:

$$\sin x - \cos(90-x) + \cot(90+x) + \cot(90-x) - \tan(270-x) = ?$$

Cevap: $-\cot x$

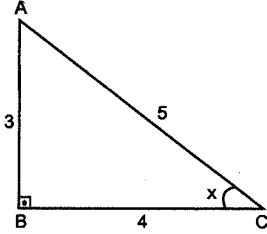
TRİGONOMETRİK DEĞERLERDEN BİRİNİN VERİLMESİ DURUMUNDA DİĞERİNİN BULUNMASI

Örnek: $0 < x < \frac{\pi}{2}$

$$\sin x = \frac{3}{5} \Rightarrow \tan x = ?$$

Çözüm:

Önce bir üçgen çizilir.



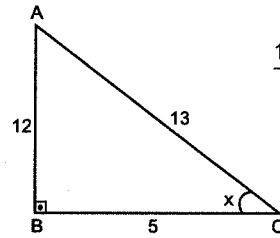
$$\tan x = \frac{3}{4}$$

Örnek: $0 < x < \frac{\pi}{2}$

$$\cos x = \frac{5}{13} \Rightarrow \tan x - \cot x = ?$$

Çözüm:

Önce bir üçgen çizilir.

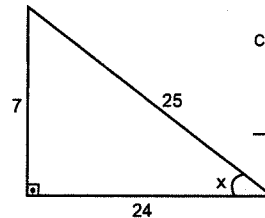


$$\frac{12}{5} - \frac{5}{12} = \frac{144 - 25}{60} = \frac{119}{60}$$

Örnek: $90 < x < 180$

$$\sin x = \frac{7}{25} \Rightarrow \cos x - \frac{1}{\sin x} = ?$$

Çözüm:



$$\cos x = -\frac{24}{25}$$

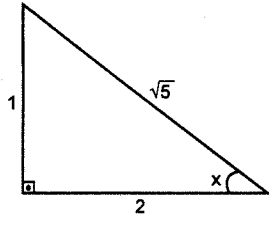
$$-\frac{24}{25} - \frac{1}{\frac{7}{25}} = -\frac{24}{25} - \frac{25}{7} = \dots$$

 $90 < x < 180$ 2. bölge

Örnek: $90 < x < 180$

$$\cos x = \frac{-2}{\sqrt{5}} \Rightarrow \frac{\sin x - \tan x}{\cot x} = ?$$

Çözüm:



$$\sin x = \frac{1}{\sqrt{5}}$$

$$\tan x = -\frac{1}{2}$$

$$\cot x = -\frac{2}{1}$$

$$\frac{\frac{1}{\sqrt{5}} - \left(-\frac{1}{2}\right)}{-2} = \frac{\frac{1}{\sqrt{5}} + \frac{1}{2}}{-2}$$

$90 < x < 180 \rightarrow 2. \text{ bölge}$

Örnek: $\pi < x < \frac{3\pi}{2}$ $\sin x = \frac{-3}{5} \Rightarrow$

$$\frac{\cos^2 x - \sin x \cdot \cos x}{\cot x - \tan x} = ?$$

Çözüm:

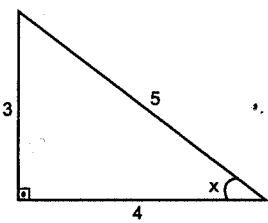
$\pi < x < \frac{3\pi}{2}$ 3. bölge

$$\sin x < 0$$

$$\cos x < 0$$

$$\cot x > 0$$

$$\tan x > 0$$



$$\cos x = -\frac{4}{5}$$

$$\tan x = \frac{3}{4}$$

$$\cot x = \frac{4}{3}$$

$$\frac{\left(-\frac{4}{5}\right)^2 - \left(-\frac{3}{5}\right) \cdot \left(-\frac{4}{5}\right)}{\frac{4}{3} - \frac{3}{4}} = \frac{\frac{16}{25} - \frac{12}{25}}{\frac{16-9}{12}} = \frac{\frac{4}{25}}{\frac{7}{12}} = \frac{4}{25} \cdot \frac{12}{7} = \frac{48}{175}$$

Örnek: $\frac{3\pi}{2} < x < 2\pi$

$$\cot x = -3 \Rightarrow \frac{\tan x - \cot x}{\sin x - \cos x} = ?$$

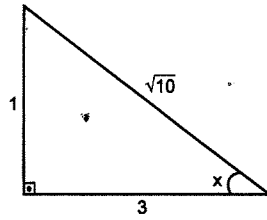
Örnek: $\frac{3\pi}{2} < x < 2\pi$ 4. bölge

$$\tan x < 0$$

$$\cot x < 0$$

$$\sin x < 0$$

$$\cos x > 0$$



$$\tan x = -\frac{1}{3}$$

$$\cot x = -3$$

$$\sin x = \frac{-1}{\sqrt{10}}$$

$$\cos x = +\frac{3}{\sqrt{10}}$$

$$\frac{-\frac{1}{3} + (3)}{-\frac{1}{\sqrt{10}} - \frac{3}{\sqrt{10}}} = \frac{\frac{8}{3}}{-\frac{4}{\sqrt{10}}} = \frac{8}{3} \cdot \frac{\sqrt{10}}{-4} = \frac{-2\sqrt{10}}{3}$$

Örnek: $\pi < x < \frac{3\pi}{2}$

$$\tan x = \frac{1}{2} \Rightarrow \frac{\cot x}{\sin x + \cos x} - \sec x + \cos x \csc x = ?$$

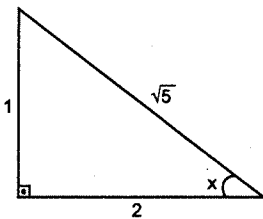
Çözüm: $\pi < x < \frac{3\pi}{2}$ 3. bölge

$$\sin x < 0$$

$$\cos x < 0$$

$$\sec x < 0$$

$$\csc x < 0$$



$$\tan x = \frac{1}{2} \Rightarrow$$

$$\cot x = 2$$

$$\sin x = -\frac{1}{\sqrt{5}}$$

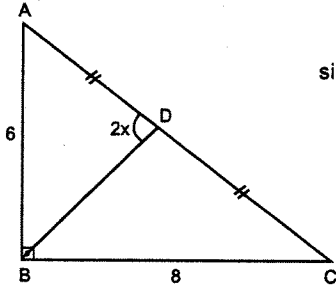
$$\cos x = -\frac{2}{\sqrt{5}}$$

$$\sec x = -\frac{\sqrt{5}}{2}$$

$$\csc x = -\sqrt{5}$$

$$\frac{2}{-\frac{1}{\sqrt{5}} - \frac{2}{\sqrt{5}}} - \frac{1}{\left(-\frac{2}{\sqrt{5}}\right)} + \frac{1}{\left(-\frac{1}{\sqrt{5}}\right)} = \dots\dots$$

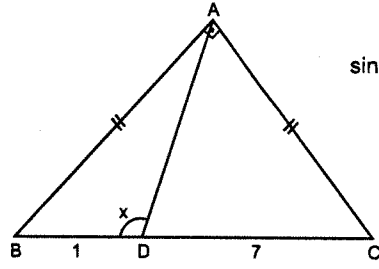
1.



$$\sin x + \cos x = ?$$

$$\text{Cevap: } \frac{7}{5}$$

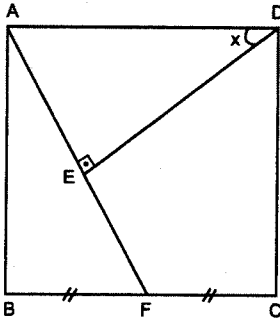
4.



$$\sin x - \cos x = ?$$

$$\text{Cevap: } \frac{7}{5}$$

2.

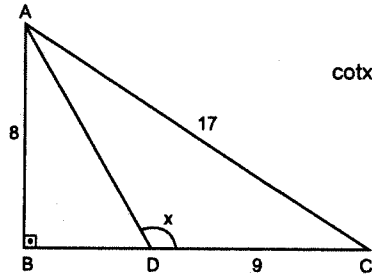


ABCD kare

$$\tan x = ?$$

$$\text{Cevap: } \frac{1}{2}$$

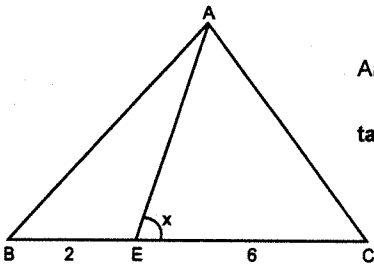
5.



$$\cot x - \tan x = ?$$

$$\text{Cevap: } \frac{7}{12}$$

3.

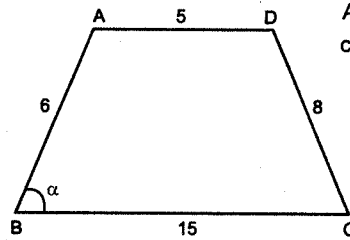


ABC eşkenar

$$\tan x = ?$$

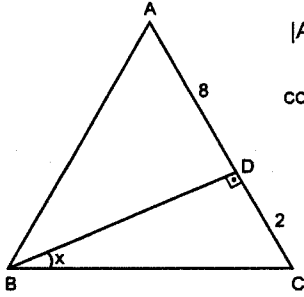
$$\text{Cevap: } 2\sqrt{3}$$

6.

ABCD yamuk
 $\cot \alpha + \tan \alpha = ?$

$$\text{Cevap: } \frac{25}{12}$$

7.

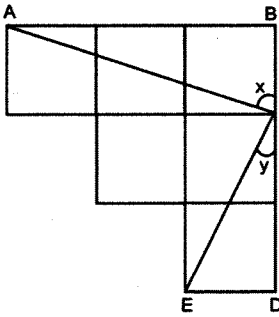


$$|AB| = |AC|$$

$$\cot x [\cos x - \sin x] = ?$$

$$\text{Cevap: } \frac{3\sqrt{10}}{5}$$

8.

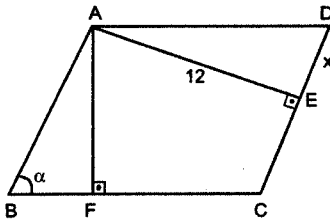


Birim karelerden
oluşan şekilde;

$$\tan x + \tan y = ?$$

$$\text{Cevap: } \frac{7}{2}$$

9.



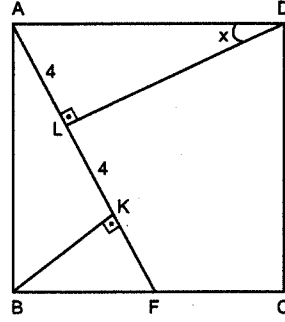
ABCD
paralelkenar

$$\tan \alpha = \frac{4}{3}$$

$$x = ?$$

$$\text{Cevap: } 9$$

10.

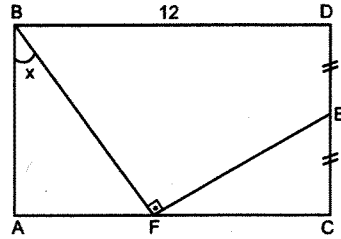


ABCD kare

$$\tan x = ?$$

$$\text{Cevap: } \frac{1}{2}$$

11.

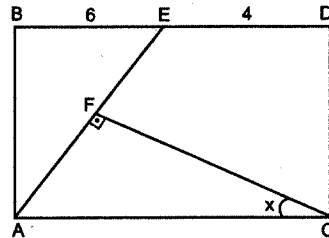


$$\cot x = 2$$

$$|FC| = ?$$

$$\text{Cevap: } 8$$

12.

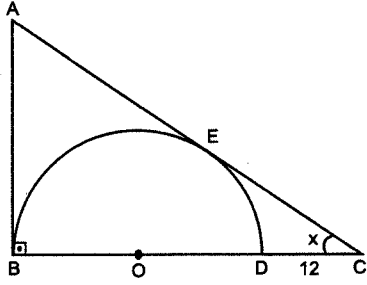


$$\tan x = \frac{3}{4}$$

$$|EF| = ?$$

$$\text{Cevap: } 4$$

13.

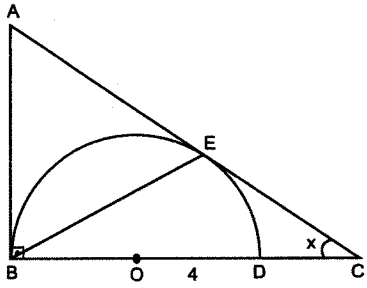


$$\tan x = \frac{5}{12}$$

$$r = ?$$

Cevap: 7,5

14.

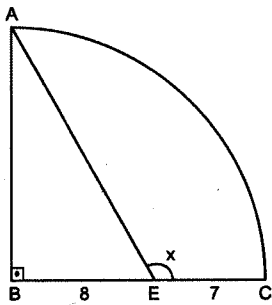


$$\sin x = \frac{1}{\sqrt{5}}$$

$$|CD| = ?$$

Cevap:
 $4\sqrt{5} - 4$

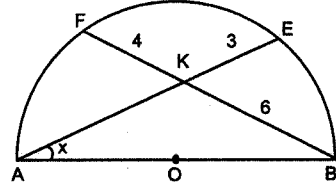
15.



$$\tan x = ?$$

Cevap: $-\frac{15}{8}$

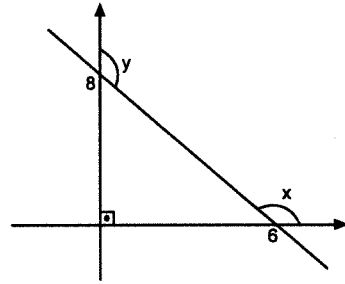
16.



$$\tan x = ?$$

Cevap: $\frac{3\sqrt{3}}{11}$

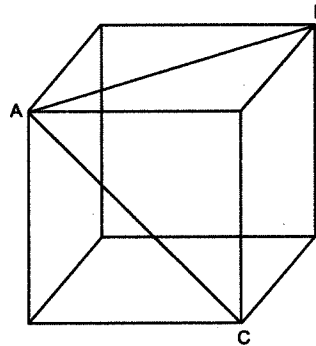
17.



$$\frac{\tan x}{\cot y} = ?$$

Cevap: 1

18.



Şekildeki küpte

$$\tan(\widehat{BAC}) = ?$$

Cevap: $\sqrt{3}$

1. $\sin 240 - \sin 330 - \cos 120 - \cos 210 = ?$

Cevap: 1

2. $\cos 315 - \tan 225 + \cot 315 - \cos 135 = ?$

Cevap: $\sqrt{2} - 2$

3. $\sin 270 - \cos 180 - \tan 180 - \cos 270 + \cot 270 = ?$

Cevap: 0

4. $\cos 120 + \cos 135 - \sin 330 - \cos 60 + \sin 300 = ?$

Cevap: $-\frac{1 + \sqrt{2} + \sqrt{3}}{2}$

5. $\tan 135 - \tan 315 + \cot 150 - \cot 240 - \tan 120 = ?$

Cevap: $-\frac{1}{\sqrt{3}}$

6. $\cot 150 - \sin 150 - \sin 210 + \cot 240 + \sin 330 + \cos 300 = ?$

Cevap: $-\frac{2}{\sqrt{3}}$

$$\sin^2 x + \cos^2 x = 1$$

$$\tan x \cdot \cot x = 1$$

1. $\frac{(1 - \sin x)(1 + \sin x)}{\cos x} = ?$

Cevap: $\cos x$

2. $\left(\frac{1}{1 + \sin x} + \frac{1}{1 - \sin x} \right) \cdot \cos x = ?$

Cevap: $\frac{2}{\cos x} = 2 \sec x$

3. $\sin^2 1 + \sin^2 2 + \sin^2 3 + \dots + \sin^2 89 = ?$

Cevap: $\frac{89}{2}$

4. $\tan 1 \cdot \tan 2 \cdot \tan 3 \dots \tan 88 \cdot \tan 89 = ?$

Cevap: 1

5. $\frac{1 - \cos x}{\sin x} + \frac{\sin x}{1 - \cos x} = ?$

Cevap: $2 \operatorname{cosec} x$

6. $\frac{1}{\sec x + \tan x} + \frac{1}{\sec x - \tan x} = ?$

Cevap: $2 \sec x$

7. $\tan x - \cot x = 2 \Rightarrow$

$\tan^2 x + \cot^2 x = ?$

Cevap: 6

8. $\sin x - \cos x = \frac{1}{3} \Rightarrow \sin x \cdot \cos x = ?$

Cevap: $\frac{4}{9}$

9. $\sin x + \cos x = -\frac{1}{5} \Rightarrow \sin x \cdot \cos x = ?$

Cevap: $-\frac{12}{25}$

10. $6x = \frac{\pi}{2} \Rightarrow \frac{\sin x}{\cos 5x} + \frac{\tan 2x}{\cot 4x}$

Cevap: 2

11. $7x = \pi \quad \frac{\sin x}{\sin 6x} + \frac{\cos x}{\cos 6x} - \frac{\tan 2x}{\tan 5x}$

Cevap: 1

12. $13x = \pi \quad \frac{\sin 6x}{\sin 7x} + \frac{\cos 5x}{\cos 8x} = ?$

Cevap: 1

$$-1 \leq \sin x \leq 1, -1 \leq \cos x \leq 1$$

1. $2\sin a - 6 = x \Rightarrow x$ in en büyük tamsayı değeri ?

Cevap: -4

2. $\frac{3\cos a - 13}{2} = x \Rightarrow x$ in en büyük tamsayı değeri ?

Cevap: -5

3. $\frac{\sin 2x - 2}{3} + \frac{\cos 2y + 6}{2}$ en büyük tamsayı değeri?

Cevap: 3

4. $|1 - \sin x| + |2 - \cos x| - |4 - \cos x| + \sin x = ?$

Cevap: -1

5. $|\cos x - 2| + |\sin x - 3| - |3 - \cos x| + |4 + \sin x| = ?$

Cevap: 6

TRİGONOMETRİ – BÖLÜM II

Toplam – fark formülleri

$$\sin(a+b) = \sin a \cdot \cos b + \cos a \cdot \sin b$$

$$\sin(a-b) = \sin a \cdot \cos b - \cos a \cdot \sin b$$

$$\cos(a+b) = \cos a \cdot \cos b - \sin a \cdot \sin b$$

$$\cos(a-b) = \cos a \cdot \cos b + \sin a \cdot \sin b$$

$$\tan(a+b) = \frac{\tan a + \tan b}{1 - \tan a \cdot \tan b}$$

$$\tan(a-b) = \frac{\tan a - \tan b}{1 + \tan a \cdot \tan b}$$

$$\cot(a+b) = \frac{1}{\tan(a+b)}$$

Yarım açı formülleri

$$\sin 2x = 2 \sin x \cos x$$

$$\begin{aligned} \cos 2x &= \cos^2 x - \sin^2 x \\ &= 2 \cos^2 x - 1 \\ &= 1 - 2 \sin^2 x \end{aligned}$$

$$\tan 2x = \frac{2 \tan x}{1 - \tan^2 x}$$

$$\cot 2x = \frac{1}{\tan 2x}$$

Örnek:

1. $\sin 40^\circ \cdot \cos 20^\circ + \cos 40^\circ \cdot \sin 20^\circ = ?$

Cevap: $\frac{\sqrt{3}}{2}$

2. $\cos 60^\circ \cdot \cos 15^\circ + \sin 60^\circ \cdot \sin 15^\circ = ?$

Cevap: $\frac{\sqrt{2}}{2}$

3. $\sin 75^\circ \cdot \cos 15^\circ + \cos 75^\circ \cdot \sin 15^\circ = ?$

Cevap: 1

4. $\frac{\tan 20^\circ + \tan 10^\circ}{1 - \tan 20^\circ \cdot \tan 10^\circ} = ?$

Cevap: $\frac{1}{\sqrt{3}}$

5. $\sin 15^\circ = ?$

Cevap: $\frac{\sqrt{6} - \sqrt{2}}{4}$

6. $\cos 15^\circ = ?$

Cevap: $\frac{\sqrt{6} + \sqrt{2}}{4}$

7. $\cos 105^\circ = ?$

Cevap: $\frac{\sqrt{2} - \sqrt{6}}{4}$

8. $\tan 15^\circ = ?$

Cevap: $2 - \sqrt{3}$

9. $\tan 165 = ?$

Cevap: $\sqrt{3} - 2$

10. $\cos 345 = ?$

Cevap: $\frac{\sqrt{6} + \sqrt{2}}{4}$

11. $\sin 255 = ?$

Cevap: $-\frac{\sqrt{6} + \sqrt{2}}{4}$

12. $\sin 15 + \cos 15 = ?$

Cevap: $\frac{\sqrt{6}}{2}$

13. $\sin 15 \cdot \cos 15 = ?$

Cevap: $\frac{1}{4}$

14. $\sin 75 \cdot \cos 75 = ?$

Cevap: $\frac{1}{4}$

15. $\sin 105 \cdot \cos 105 = ?$

Cevap: $-\frac{1}{4}$

16. $\frac{\sin 36}{\sin 12} - \frac{\cos 36}{\cos 12} = ?$

Cevap: 2

17. $0 < x < \frac{\pi}{2}$

$\sin x = \frac{3}{5} \Rightarrow \sin 2x = ?$

Cevap: $\frac{24}{25}$

18. $0 < x < \frac{\pi}{2}$

$\cos x = \frac{1}{3} \Rightarrow \sin 2x = ?$

Cevap: $\frac{4\sqrt{2}}{9}$

19. $0 < x < \frac{\pi}{2}$

$$\tan x = \frac{2}{3} \Rightarrow \sin 2x = ?$$

Cevap: $\frac{12}{13}$

20. $0 < x < \frac{\pi}{2}$

$$\cot x = \frac{3}{4} \Rightarrow \sin 2x = ?$$

Cevap: $\frac{24}{25}$

21. $0 < x < \frac{\pi}{2}$

$$\tan x = \frac{5}{12} \Rightarrow \cos 2x = ?$$

Cevap: $\frac{119}{169}$

22. $0 < x < \frac{\pi}{2}$

$$\cot x = 2 \Rightarrow \cos 2x = ?$$

Cevap: $+\frac{3}{5}$

23. $0 < x < \frac{\pi}{2}$

$$\cot x = \frac{1}{2} \Rightarrow \tan 2x = ?$$

Cevap: $-\frac{4}{3}$

24. $0 < x < \frac{\pi}{2}$

$$\sin x = \frac{3}{4} \Rightarrow \cos 2x = ?$$

Cevap: $-\frac{1}{8}$

25. $0 < x < \frac{\pi}{2}$

$$\sin x = \frac{4}{5} \Rightarrow \cot 2x = ?$$

Cevap: $-\frac{7}{24}$

26. $\frac{\pi}{2} < x < \pi$

$$\sin x = \frac{1}{3} \Rightarrow \cos 2x = ?$$

Cevap: $\frac{7}{9}$

27. $\frac{\pi}{2} < x < \pi$

$$\sin x = \frac{2}{3} \Rightarrow \sin 2x = ?$$

Cevap: $-\frac{4\sqrt{5}}{9}$

28. $\frac{\pi}{2} < x < \pi$

$$\cos x = -\frac{1}{4} \Rightarrow \cos 2x = ?$$

Cevap: $-\frac{7}{8}$

29. $\frac{\pi}{2} < x < \pi$

$$\tan x = -\frac{3}{4} \Rightarrow \tan 2x = ?$$

Cevap: $-\frac{24}{7}$

30. $\pi < x < \frac{3\pi}{2}$

$$\cos x = -\frac{5}{13} \Rightarrow \sin 2x = ?$$

Cevap: $\frac{120}{169}$

31. $\frac{3\pi}{2} < x < 2\pi$

$$\sin x = -\frac{4}{5} \quad \begin{array}{l} \text{a) } \cos 2x = ? \\ \text{b) } \tan 2x = ? \\ \text{c) } \sin 2x = ? \\ \text{d) } \cot 2x = ? \end{array}$$

Cevap: a) $-\frac{7}{25}$

b) $\frac{24}{7}$

c) $-\frac{24}{25}$

d) $\frac{7}{24}$

32. $0 < x < \frac{\pi}{2}$

$$\sin 2x = \frac{4}{5} \Rightarrow \sin x = ?$$

Cevap: $\frac{1}{\sqrt{5}}$

33. $0 < x < \frac{\pi}{2}$

$$\tan 2x = 2 \Rightarrow \tan x = ?$$

Cevap: $\frac{2}{\sqrt{5}+1}$

34. $\frac{\pi}{2} < x < \pi$

$$\sin 2x = \frac{-5}{13} \Rightarrow \tan x = ?$$

Cevap: $-\frac{1}{5}$

35. $\frac{\pi}{2} < x < \pi$

$$\cos 2x = \frac{4}{5} \Rightarrow \cot x = ?$$

Cevap: -3

36. $\pi < x < \frac{3\pi}{2}$

$$\tan 2x = 2 \Rightarrow \cot x = ?$$

Cevap: $\frac{\sqrt{5}+1}{2}$

37. $\frac{3\pi}{2} < x < 2\pi$

$$\cos 2x = -\frac{4}{5} \Rightarrow \cos x = ?$$

Cevap: $\frac{3}{\sqrt{10}}$

38. $\sin x + \cos x = \frac{1}{2} \Rightarrow \sin 2x = ?$

Cevap: $-\frac{3}{4}$

39. $\sin x - \cos x = \frac{1}{5} \Rightarrow \sin 2x = ?$

Cevap: $\frac{24}{25}$

40. $\sin x + \cos x = -\frac{2}{3} \Rightarrow \sin 2x = ?$

Cevap: $-\frac{5}{9}$

41. $\sin x - \cos x = -\frac{4}{5} \Rightarrow \sin 2x = ?$

Cevap: $\frac{9}{25}$

42. $\frac{3\pi}{2} < 2x < 2\pi$

$\sin x + \cos x = -\frac{1}{3} \Rightarrow \cos 2x = ?$

Cevap: $\frac{\sqrt{17}}{9}$

43. $0 < x < \frac{\pi}{2}$

$\sin x - \cos x = \frac{1}{5} \Rightarrow \tan 2x = ?$

Cevap: $-\frac{24}{7}$

44. $\sin x + \cos x = \frac{1}{4} \Rightarrow \sin 2x = ?$

Cevap: $-\frac{15}{16}$

45. $\cos 12 = m \Rightarrow \cos 24 = ?$

Cevap: $2m^2 - 1$

46. $\sin 16 = p \Rightarrow \sin 58 = ?$

Cevap: $1 - 2p^2$

47. $\tan 17 = k \Rightarrow \tan 34 = ?$

Cevap: $\frac{2k}{1 - k^2}$

48. $\sin 32 = t \Rightarrow \cos 26 = ?$

Cevap: $2.t.\sqrt{1-t^2}$

49. $\cot 12 = y \Rightarrow \tan 24 = ?$

Cevap: $\frac{2y}{y^2-1}$

50. $\sin 14 = b \Rightarrow \cos 28 = ?$

Cevap: $1-2b^2$

51. $\frac{1}{\sin 15} + \frac{1}{\cos 15} = ?$

Cevap: $2\sqrt{6}$

52. $\frac{1}{\sin 15} - \frac{1}{\cos 15} = ?$

Cevap: $2\sqrt{2}$

53. $\frac{\cos 2x}{\cos x + \sin x} = ?$

Cevap: $\cos x - \sin x$

54. $\frac{\cos x - \sin x}{1 - \sin 2x} = ?$

Cevap: $\frac{1}{\cos x - \sin x}$

55. $\frac{\sin^3 x - \cos^3 x}{\sin x - \cos x} = \frac{1}{2} \Rightarrow \sin 2x = ?$

Cevap: -1

56. $\frac{2\cos^2 15 - 1}{\sin 15 \cos 15} = ?$

Cevap: $2\sqrt{3}$

57. $\cos^2 x = \frac{1}{4} \Rightarrow \cos 2x = ?$

Cevap: $-\frac{1}{2}$

58. $\frac{1}{\cos x} - \frac{\sin 3x}{\cos 3x \cdot \sin x} = ?$

Cevap: $-2\sec 3x$

59. $\frac{1 - \cos 2x}{\sin x} = ?$

Cevap: $2\sin x$

60. $\frac{1 + \cos 2x}{\cos x} = ?$

Cevap: $2\cos x$

61. $\frac{1 + \cos 2x}{\sin 2x} = ?$

Cevap: $\cot x$

62. $\frac{1 - \cos 2x}{\sin 2x} = ?$

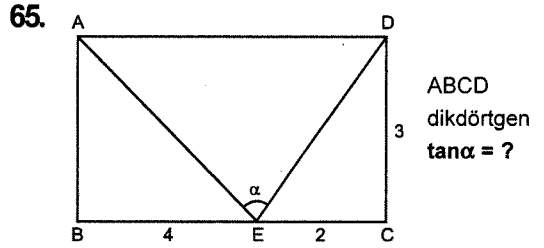
Cevap: $\tan x$

63. $\frac{1 - \cos 2x}{2} = ?$

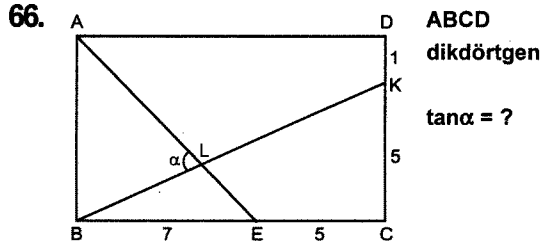
Cevap: $\sin^2 x$

64. $\frac{1 + \cos 2x}{2} = ?$

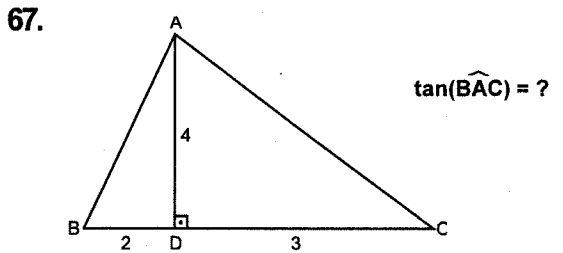
Cevap: $\cos^2 x$



Cevap: 18

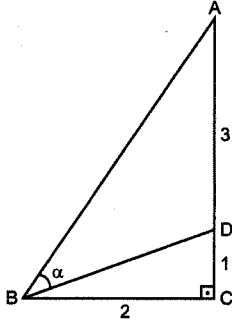


Cevap: $\frac{107}{54}$



Cevap: 2

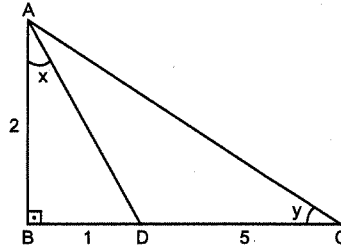
68.



$$\tan \alpha = ?$$

$$\text{Cevap: } \frac{3}{4}$$

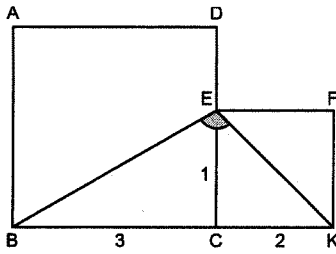
72.



$$y+x = ?$$

$$\text{Cevap: } 45^\circ$$

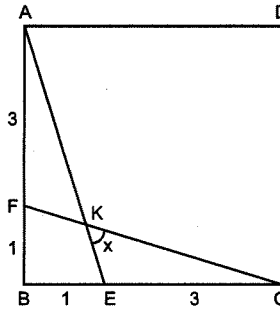
69.



ABCD kare
ECKF
dikdörtgen
 $\tan(\widehat{BEK}) = ?$

$$\text{Cevap: } -1$$

73.

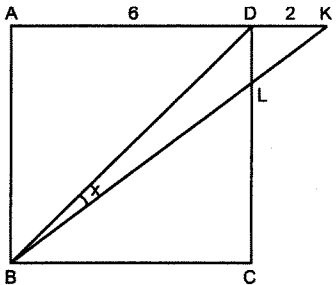


ABCD Kare

$$\tan x = ?$$

$$\text{Cevap: } \frac{15}{8}$$

70.

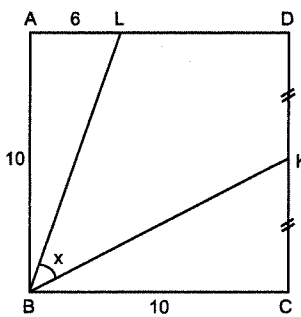


ABCD kare

$$\tan x = ?$$

$$\text{Cevap: } \frac{1}{7}$$

74.

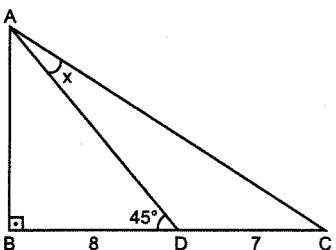


ABCD kare

$$\tan x = ?$$

$$\text{Cevap: } \frac{7}{11}$$

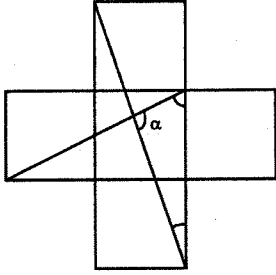
71.



$$\tan x = ?$$

$$\text{Cevap: } \frac{7}{23}$$

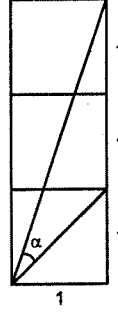
75.



Birim karelerden
oluşan şekilde
 $\tan \alpha = ?$

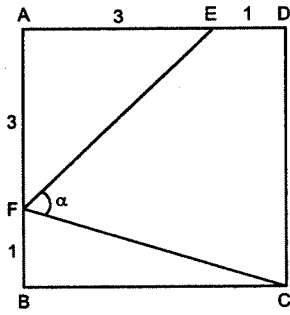
Cevap: -7

78.

 $\cot \alpha = ?$

Cevap: 2

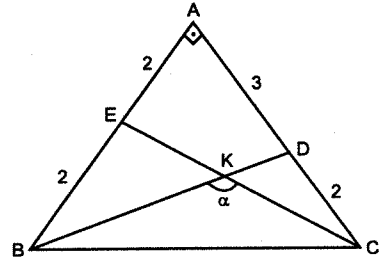
76.



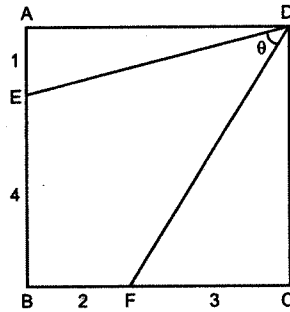
ABCD Kare

 $\tan \alpha = ?$ Cevap: $\frac{5}{3}$

79.

 $\cot \alpha = ?$ Cevap: $-\frac{23}{14}$

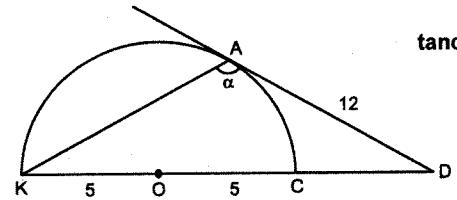
77.



ABCD kare

 $\tan \theta = ?$ Cevap: $\frac{11}{10}$

80.

 $\tan \alpha = ?$ Cevap: $-\frac{3}{2}$

Ters Trigonometrik Fonksiyonlar

$$\begin{aligned}
 \arcsin x = y &\Rightarrow \sin y = x \\
 \arcsin y = x &\Rightarrow \sin x = y \\
 \arccos y = x &\Rightarrow \cos x = y \\
 y = \tan x &\Rightarrow x = \arctan y \\
 y = \cot x &\Rightarrow x = \operatorname{arccot} y
 \end{aligned}$$

$$\text{Örnek: } \arcsin \frac{1}{2} = x \Rightarrow x \in \left[0, \frac{\pi}{2}\right] \\
 x = ?$$

$$\text{Cevap: } x = \frac{\pi}{6}$$

$$\text{Örnek: } \arcsin \frac{\sqrt{3}}{2} = x \Rightarrow x \in [0, \pi] \\
 x = ?$$

$$\text{Cevap: } x_1 = 60, 120$$

$$\text{Örnek: } \arccos -\frac{1}{2} = x \Rightarrow x \in [0, 2\pi] \\
 x = ?$$

$$\begin{aligned}
 \text{Cevap: } x_1 &= 120 \\
 x_2 &= 240^\circ
 \end{aligned}$$

$$\text{Örnek: } x = \arctan \sqrt{3} \Rightarrow x \in \left[\pi, \frac{3\pi}{2}\right] \\
 x = ?$$

$$\text{Cevap: } 240 = x$$

$$\begin{aligned}
 \text{Örnek: } \arctan -1 = x &\Rightarrow x \in [\pi, 2\pi] \\
 x &= ?
 \end{aligned}$$

$$\text{Cevap: } 315 = x$$

$$\text{Örnek: } \operatorname{arccot} \frac{1}{\sqrt{3}} = x \Rightarrow x \in \left[0, \frac{\pi}{2}\right]$$

$$\text{Cevap: } x = 60^\circ$$

$$\text{Örnek: } \sin \left(\arccos \frac{2}{3} \right) + \cos \left(\arcsin \frac{1}{4} \right) = ?$$

$$\text{Cevap: } \frac{4\sqrt{5} + 3\sqrt{15}}{12}$$

$$\text{Örnek: } \sin \left[\arccos \frac{3}{5} + \arctan 2 \right] = ?$$

$$\text{Cevap: } \frac{2}{\sqrt{5}}$$

$$\text{Örnek: } \sin(2\arctan 2) = ?$$

$$\text{Cevap: } \frac{4}{5}$$

Örnek: $\alpha = \arctan \frac{1}{3} + \arctan 2$

$\tan \alpha = ?$

Cevap: 7

Örnek: $\arcsin \frac{3}{5} + \arcsin \frac{4}{5} = ?$

Cevap: $\frac{\pi}{2}$

Örnek: $\arccos \left(\frac{1}{4} \right) + \arccos \left(-\frac{1}{4} \right) = ?$

Cevap: π

Örnek: $\arctan 3 + \arctan 2 = ?$

Cevap: 135°

Örnek: $\cos \left(\arctan \frac{3}{4} \right) = ?$

Cevap: $\frac{4}{5}$

Örnek: $\sin \left(2 \arcsin \frac{1}{3} \right) = ?$

Cevap: $\frac{4\sqrt{2}}{9}$

Örnek: $\tan \left(\arcsin \frac{\sqrt{3}}{2} \right) = ?$

Cevap: $\sqrt{3}$

Örnek: $\sin \left(\arccos \frac{1}{3} \right) = ?$

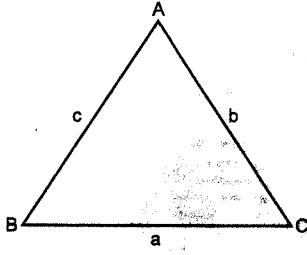
Cevap: $\frac{2\sqrt{2}}{3}$

Örnek: $\arcsin \left(\sin \frac{3\pi}{5} \right) = ?$

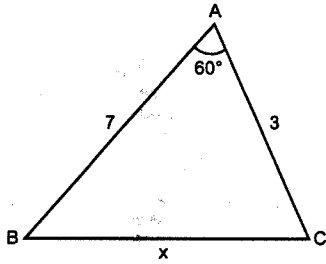
Cevap: $\frac{3\pi}{5}$

Örnek: $\tan \left(\arcsin \frac{3}{5} + \arccos \frac{5}{13} \right) = ?$

Cevap: $-\frac{63}{16}$

Cosinüs Teoremi

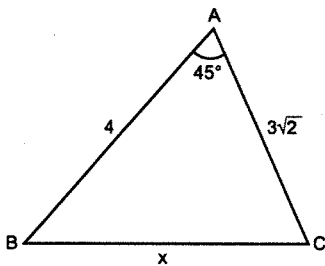
$$a^2 = b^2 + c^2 - 2bc \cdot \cos A$$

Örnek:

$$x^2 = 7^2 + 3^2 - 2 \cdot 7 \cdot 3 \cdot \cos 60$$

$$x^2 = 49 + 9 - 42 \cdot \frac{1}{2}$$

$$x^2 = 58 - 21 = 37 \Rightarrow x = \sqrt{37}$$

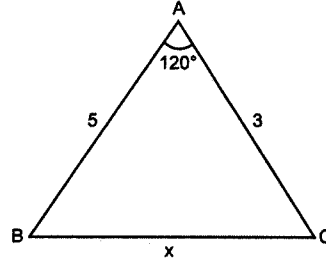
Örnek:

$$x^2 = 16 + 18 - 2 \cdot 4 \cdot 3\sqrt{2} \cdot \cos 45$$

$$x^2 = 34 - 24\sqrt{2} \cdot \frac{\sqrt{2}}{2}$$

$$x^2 = 34 - 24$$

$$x = \sqrt{10}$$

Örnek:

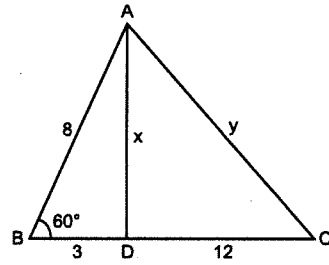
$$x^2 = 5^2 + 3^2 - 2 \cdot 5 \cdot 3 \cdot \cos 120^\circ$$

$$x^2 = 25 + 9 + 30 \cdot \left(-\frac{1}{2}\right)$$

$$x^2 = 34 + 15$$

$$x^2 = 49$$

$$x = 7$$

Örnek:

$$x = ?$$

$$y = ?$$

$$x^2 = 8^2 + 3^2 - 2 \cdot 8 \cdot 3 \cdot \cos 60$$

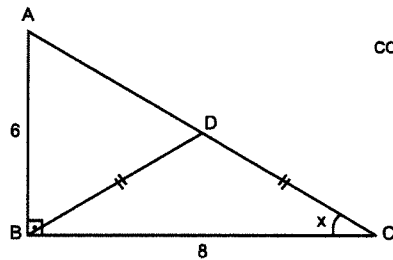
$$x^2 = 64 + 9 - 48 \cdot \frac{1}{2}$$

$$x^2 = 73 - 24 = 49$$

$$x = 7$$

$$y^2 = 8^2 + 15^2 - 2 \cdot 8 \cdot 15 \cdot \cos 60$$

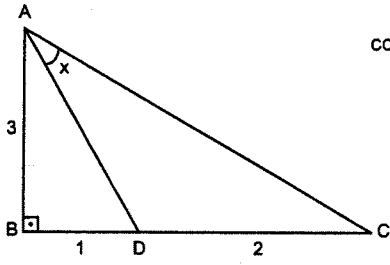
$$y = 13$$

Örnek:

$$\cos 2x = ?$$

$$\text{Cevap: } \frac{7}{25}$$

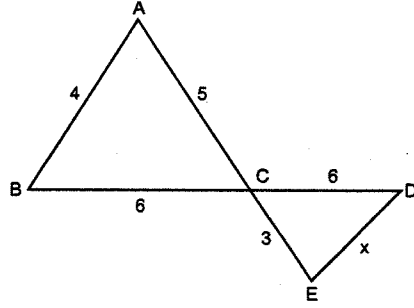
Örnek:



$$\cos x = ?$$

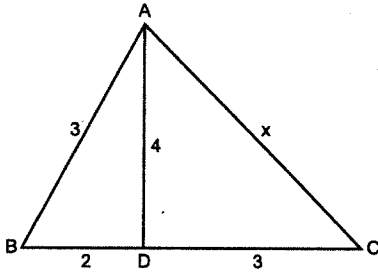
$$\text{Cevap: } \frac{\sqrt{20}}{5}$$

Örnek:



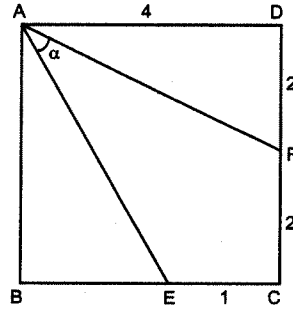
$$\text{Cevap: } 3\sqrt{2}$$

Örnek:



$$\text{Cevap: } \frac{\sqrt{53}}{\sqrt{2}}$$

Örnek:

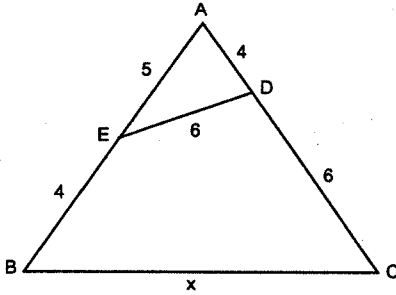


ABCD kare

$$\cos \alpha = ?$$

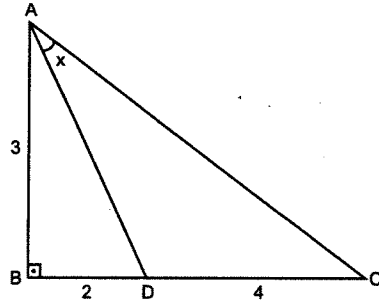
$$\text{Cevap: } \frac{2}{\sqrt{5}}$$

Örnek:



$$\text{Cevap: } \sqrt{\frac{317}{2}}$$

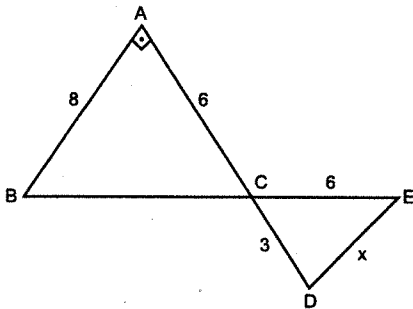
Örnek:



$$\cos x = ?$$

$$\text{Cevap: } \frac{7}{\sqrt{65}}$$

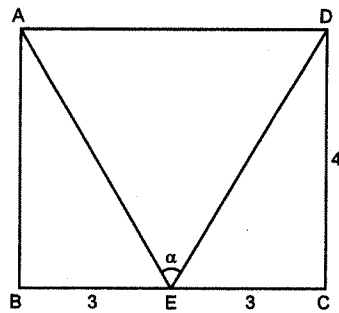
Örnek:



$$x = ?$$

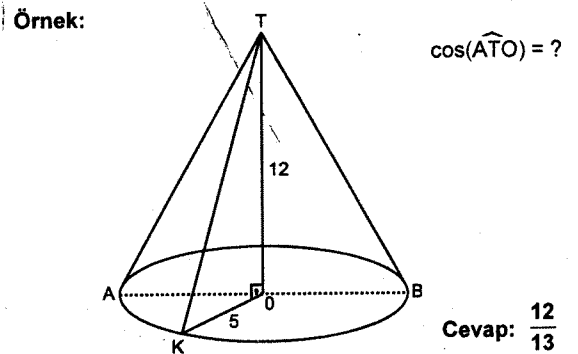
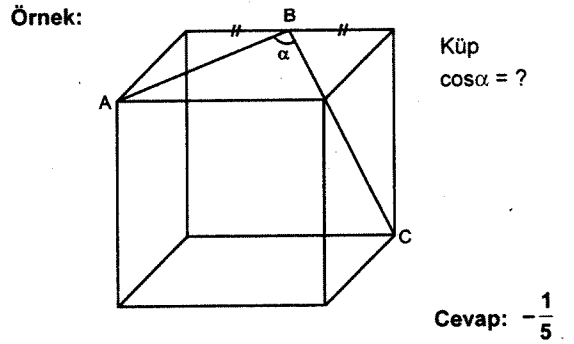
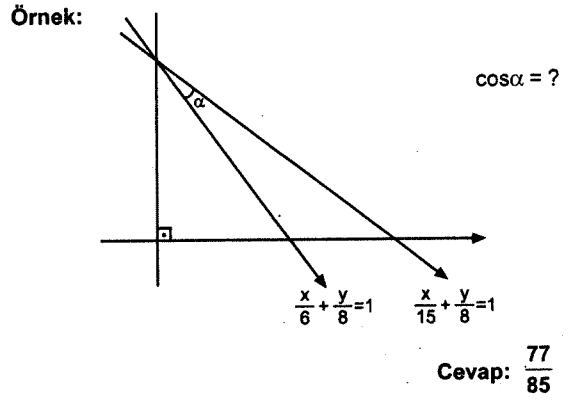
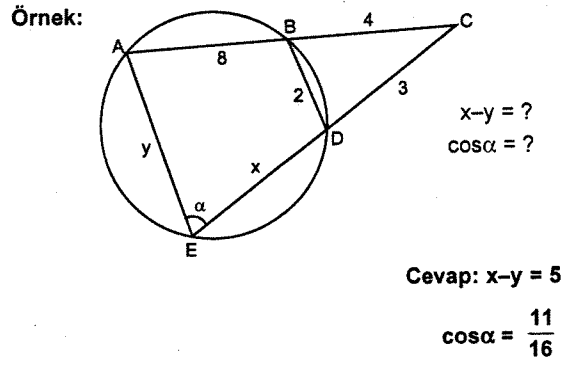
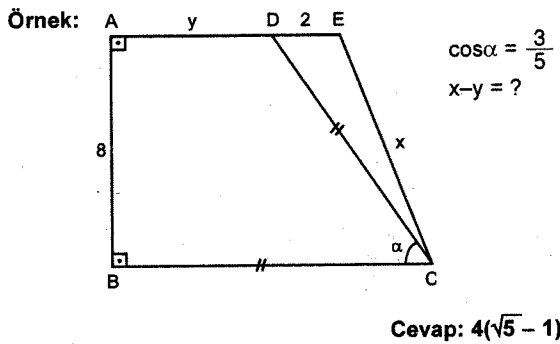
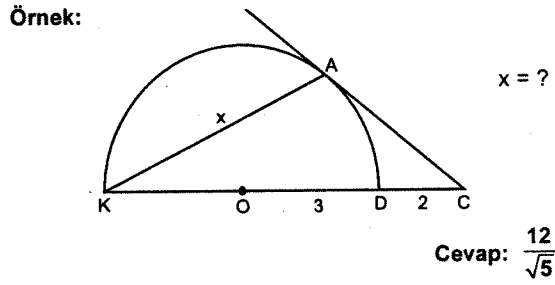
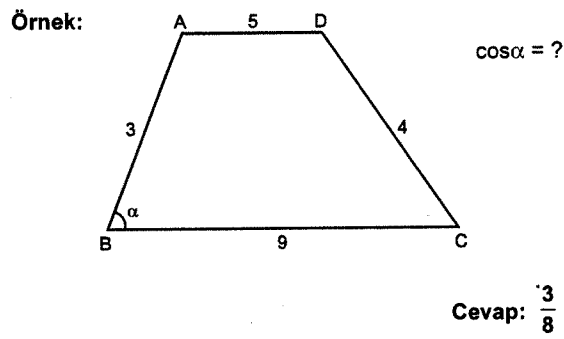
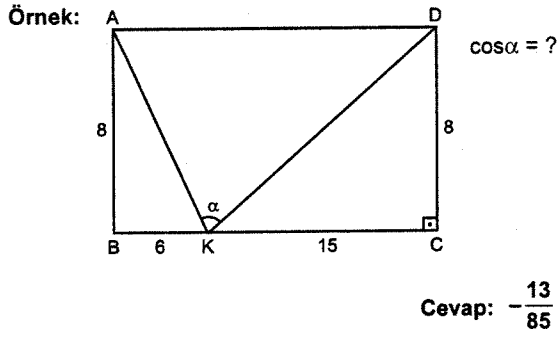
$$\text{Cevap: } \sqrt{\frac{117}{5}}$$

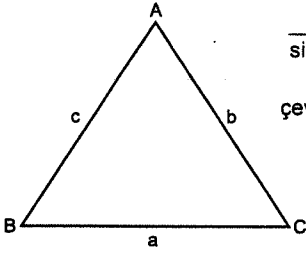
Örnek:

ABCD
dikdörtgen

$$\cos \alpha = ?$$

$$\text{Cevap: } \frac{7}{25}$$



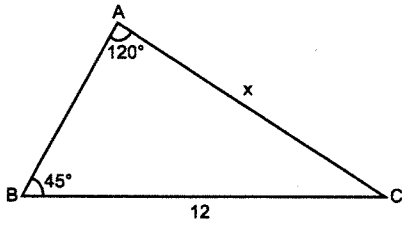
Sinüs Teoremi

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} = 2R$$

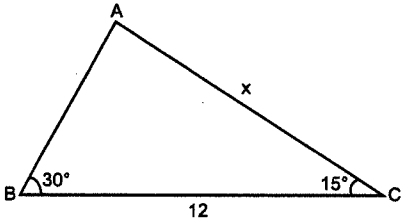
çevrel çemberin yarıçapı (R)

$$\text{Alan}(\widehat{ABC}) = \frac{a \cdot b \cdot c}{4R}$$

Örnek:

Cevap: $4\sqrt{6}$

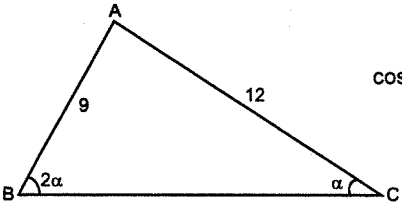
Örnek:



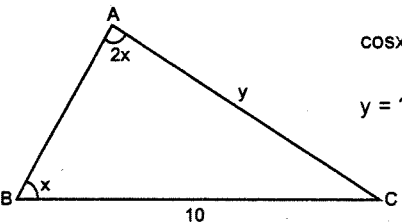
x = ?

Cevap: $6\sqrt{2}$

Örnek:

 $\cos \alpha = ?$ Cevap: $\frac{2}{3}$

Örnek:

 $\cos x = \frac{3}{5}$

y = ?

Cevap: $\frac{25}{3}$ **Esas Periyot:**

$$\sin^n(ax+b) \begin{cases} \frac{2\pi}{|a|}, & n \text{ tek ise} \\ \frac{\pi}{|a|}, & n \text{ çift ise} \end{cases} \quad n \in \mathbb{Z}$$

$$\tan^n(ax+b) \begin{cases} \frac{\pi}{|a|}, & n \in \mathbb{Z} \end{cases}$$

Örnek: Aşağıdaki fonksiyonların esas periyotlarını bulunuz.

$$\sin(2x-1) =$$

$$\sin^2(3x+6) =$$

$$\cos(2x+6) =$$

$$\cos^6(12x-5) =$$

$$\tan^7(3x-5) = ?$$

$$\cot^6(5x-5) =$$

$$\sin^3(3x-2) + \cos^2(3x+1) = ?$$

$$\sin^4(5x-5) + \tan^3(3x-1)$$

$$\text{okek}\left(\frac{\pi}{5}, \frac{\pi}{3}\right) = 360^\circ$$

$$\cot(5x-5) + \cot^7(6x+6) = ?$$

$$\text{okek}\left(\frac{\pi}{5}, \frac{\pi}{6}\right) = 180^\circ$$

$$\sin^3 x + \cos^2(2x-1) + \tan(5x-5) = ?$$

$$\text{okek}\left(2\pi, \frac{\pi}{2}, \frac{\pi}{5}\right) = 360^\circ$$

Dönüşüm Formülleri

$$\sin x + \sin y = 2 \sin \frac{x+y}{2} \cdot \cos \frac{x-y}{2}$$

$$\sin x - \sin y = 2 \cos \frac{x+y}{2} \cdot \sin \frac{x-y}{2}$$

$$\cos x + \cos y = 2 \cos \frac{x+y}{2} \cdot \cos \frac{x-y}{2}$$

$$\cos x - \cos y = -2 \sin \frac{x+y}{2} \cdot \sin \frac{x-y}{2}$$

Not: Baştaki terim ile sondaki terimin toplamının yarısı ortadaki terimi veriyorsa ortadaki terimlerin birbirine oranı sonucu verir.

Örnek: $\frac{\cos 2x + \cos 6x + \cos 10x}{\sin 2x + \sin 6x + \sin 10x} = \frac{\cos 6x}{\sin 6x} = \cot 6x$
gibi

Örnek: $\cos 40 + \cos 80 = ?$

Cevap: $\cos 20$

Örnek: $\frac{\sin 64 + \sin 26}{2} = ?$

Cevap: $\frac{\sqrt{2}}{2} \cos 19$

Örnek: $\frac{\cos 20 + \cos 40}{\sin 20 + \sin 40} = ?$

Cevap: $\sqrt{3}$

Örnek: $8x = \pi$ ise

$$\frac{\cos 6x + \cos 2x}{\cos 4x}$$

Pay için dönüşüm formülü uygula sonra $2x$ yerine 45° yaz.

Cevap: $\sqrt{2}$

Örnek: $7x = \frac{\pi}{2}$

$$\frac{\cos 6x + \cos 8x}{\sin 8x + \sin 6x}$$

2 dönüşüm formülü uygula.

Cevap: 0

Örnek: $\frac{\cos 80 + \cos 20}{\cos 70 - \cos 10}$

2 dönüşüm formülü uygula.

Cevap: $-\sqrt{3}$

Örnek: $a+b = \frac{\pi}{2}$

$$\frac{\sin a - \cos b}{\sin a + \cos b} = ?$$

Birbirini 90° ye tamamlayan açılarının kuralını aklına getir.

Cevap: 0

Örnek: $\frac{\cos 7x + \cos 8x + \cos 9x}{\sin 7x - \sin 8x + \sin 9x} = ?$

Not'a bak.

Cevap: $-\cot 8x$

Örnek: $\sin 20^\circ + \sin 40^\circ + \sin 80^\circ = ?$

Çözüm: $\sin 20^\circ + \sin 40^\circ$ için dönüşüm formülü uygula.

Cevap: $2\cos 10^\circ$

Örnek: $\cos 10^\circ \cdot \cos 20^\circ \cdot \cos 40^\circ \cdot \cos 80^\circ = ?$

Çözüm: Pay ve paydayı $2\sin 10^\circ$ ile çarp, böl.

$$\frac{2\sin 10^\circ \cdot \cos 10^\circ \cdot \cos 20^\circ \cdot \cos 40^\circ \cdot \cos 80^\circ}{2\sin 10^\circ} = \frac{\sin 20^\circ \cos 20^\circ \cos 40^\circ \cos 80^\circ}{2\sin 10^\circ} =$$

Cevap: $\frac{\cos 10^\circ}{8}$

Örnek: $\frac{1}{\cos 10^\circ} + \frac{\sqrt{3}}{\sin 10^\circ} = ?$

Çözüm: $\sqrt{3} = \tan 60^\circ$ dönüşümü yap, paydayı eşitle işlem hatası yapma.

Cevap: $4\cot 20^\circ$

Örnek: $\sin 75^\circ + \sqrt{3} \cdot \cos 75^\circ = ?$

Çözüm: $\sqrt{3} = \tan 60^\circ$ dönüşümü yap paydayı eşitle.

Cevap: $\sqrt{2}$

BÖLÜM III – TRİGONOMETRİK DENKLEMLER

$$\sin x = \sin \alpha \Rightarrow \begin{aligned} x_1 &= \alpha + 2k\pi \\ x_2 &= (180 - \alpha) + 2k\pi \end{aligned} \quad k \in \mathbb{Z}$$

$$\cos x = \cos \alpha \Rightarrow \begin{aligned} x_1 &= \alpha + 2k\pi \\ x_2 &= -\alpha + 2k\pi \end{aligned} \quad k \in \mathbb{Z}$$

$$\tan x = \tan \alpha \Rightarrow x = \alpha + k\pi \quad k \in \mathbb{Z}$$

$$\cot x = \cot \alpha$$

Örnek: $x \in [0, 2\pi]$

$$\sin 2x = \frac{1}{2} \Rightarrow \begin{aligned} 2x &= 30^\circ + 2k\pi \Rightarrow x_1 = 15 + k\pi \\ 2x &= (180 - 30) + 2k\pi \Rightarrow x_2 = 75 + k\pi \end{aligned}$$

$$\text{Ç.K} = \left\{ \begin{aligned} &x_1 = 15, x_2 = 75 \quad k=0 \\ &x_1 = 195, x_2 = 255 \quad k=1 \end{aligned} \right\}$$

Örnek: $\cos x = -\frac{1}{2} \Rightarrow x \in [0, 2\pi]$

Çözüm: $\begin{aligned} x_1 &= 120^\circ + 2k\pi \\ x_2 &= 240^\circ + 2k\pi \\ x_1 &= -120^\circ + 2k\pi \end{aligned}$

$$\text{Ç.K} = \left\{ \begin{aligned} &x_1, x_2 \\ &120, 240 \end{aligned} \Rightarrow \text{Ç.K} = 120, 240 \right\}$$

Örnek: $\sin 3x = \cos 2x \Rightarrow x \in [0, 2\pi] \quad \text{Ç.K} = ?$

Çözüm: $\sin 3x = \sin(90 - 2x)$

$$\begin{aligned} 3x &= 90 - 2x + 2k\pi & 3x &= 180 - [90 - 2x] + 2k\pi \\ 5x &= 90 + 2k\pi & 3x &= 90 + 2x - 2k\pi \\ x_1 &= 18^\circ + \frac{2k\pi}{5} & x_2 &= 90 + 2k\pi \end{aligned}$$

$$\text{Ç.K} = \left\{ \begin{aligned} &\frac{x_1}{k=0}, \frac{x_2}{k=0}, \frac{x_1}{k=1}, \frac{x_2}{k=1}, \frac{x_1}{k=2}, \frac{x_2}{k=2}, \frac{x_1}{k=3}, \frac{x_2}{k=3}, \frac{x_1}{k=4}, \frac{x_2}{k=4} \end{aligned} \right\}$$

$$\text{Ç.K} = \{18^\circ, 90^\circ, 162^\circ, 243^\circ, 306^\circ\}$$

Örnek: $\tan 3x = \cot 5x \Rightarrow x \in \left[0, \frac{\pi}{2}\right] \quad \text{Ç.K} = ?$

$$\begin{aligned} \tan 3x &= \tan(90 - 5x) \\ 3x &= 90 - 5x + k\pi \end{aligned}$$

$$8x = 90 + k\pi \Rightarrow x = \frac{90}{8} + \frac{k\pi}{8} \quad k \in \mathbb{Z}$$

$$\text{Ç.K} = \left\{ \frac{90}{8}, \frac{90+180}{8}, \frac{90+360}{8}, \frac{90+540}{8}, \dots \right\}$$

$$\text{Ç.K} = \left\{ \frac{90}{8}, \frac{135}{4}, \frac{300}{4}, \frac{225}{4}, \frac{375}{4}, \frac{450}{4}, \dots \right\}$$

$$\left[0, \frac{\pi}{2}\right] \text{ aralığında } \text{Ç.K} = \left\{ \frac{90}{8}, \frac{135}{4}, \frac{225}{4}, \frac{300}{4} \right\}$$

Örnek: $\tan x \cdot \tan 3x = 1 \quad \left[0, \frac{\pi}{2}\right] \text{ aralığında kökler toplamı?}$

Çözüm:

$$\tan x = \frac{1}{\tan 3x} \Rightarrow \tan x = \cot 3x \Rightarrow \tan x = \tan(90 - 3x)$$

$$\Rightarrow x = 90 - 3x + k\pi \quad 4x = 90 + k\pi \Rightarrow x = \frac{90}{4} + \frac{k\pi}{4}$$

Örnek:

$$1 - \sin^2 x + 2 \sin x \cos x - 1 = 0 \quad x \in [0, 2\pi] \rightarrow \text{Ç.K} = ?$$

Çözüm:

$$\begin{aligned} 1 - 2\sin^2 x &= \cos 2x \\ 2 \sin x \cos x &= \sin 2x \end{aligned} \Rightarrow \cos 2x + \sin 2x = 0$$

$$\begin{aligned} -\tan 2x &= 1 \\ \tan 2x &= -1 \end{aligned}$$

$$2x = 135 + k\pi$$

$$x = \frac{135}{2} + \frac{k\pi}{2} \Rightarrow \text{Ç.K} = \left\{ \begin{aligned} &\frac{x}{k=0}, \frac{x}{k=1}, \frac{x}{k=3}, \frac{x}{k=3} \\ &\frac{135}{2}, \frac{315}{2}, \frac{495}{2}, \frac{675}{2} \end{aligned} \right\}$$

Örnek: $2\sin^2x + 3\sin 2x - 2 = 0 \Rightarrow x \in [0, \pi]$ aralığındaki kökler toplamı?

Çözüm:

$$2\sin^2x + 3\sin 2x - 2 = 0 \quad (2\sin 2x - 1)(\sin 2x + 2) = 0$$

$$2\sin 2x = 1 \quad \sin 2x = \frac{1}{2} \quad \sin 2x = -2$$

$$\sin 2x = \frac{1}{2}$$

$$\sin 2x = \frac{1}{2} \Rightarrow 2x = 30 + 2k\pi \Rightarrow x_1 = 15 + k\pi$$

$$2x = (180 - 30) + 2k\pi \quad x_2 = 75 + k\pi$$

$$\text{Toplam} \rightarrow x_1 + x_2 = 15 + 75 = 90$$

Not: $a \cdot \cos x + b \cdot \sin x$ ifadesinin

en büyük değeri $\sqrt{a^2 + b^2}$

en küçük değeri $-\sqrt{a^2 + b^2}$

Örnek: $3\sin x - 4\cos x$ in en büyük değeri kaçtır?

$$\sqrt{3^2 + (-4)^2} = 5 \text{ tir.}$$

Örnek: $7\sin x + 24\cos x$ in en küçük değeri kaçtır?

$$-\sqrt{7^2 + 24^2} = -25 \text{ tir.}$$

Örnek: $\cos x + \sqrt{3} \sin x = \sqrt{3} \Rightarrow x$ dar açısı kaç derecedir?

$$\sqrt{3} = \tan 60$$

$$\cos x + \frac{\sin 60}{\cos 60} \sin x = \sqrt{3}$$

$$\frac{\cos x \cdot \cos 60 + \sin 60 \cdot \sin x}{\cos 60} = \sqrt{3} \Rightarrow \frac{\cos(x-60)}{\frac{1}{2}} = \sqrt{3}$$

$$\Rightarrow \cos(x-60) = \frac{\sqrt{3}}{2}$$

$$x-60 = 30 + 2k\pi \Rightarrow x_1 = 90 + 2k\pi$$

$$x-60 = -30 + 2k\pi \Rightarrow x_2 = 30 + 2k\pi$$

$$\Rightarrow x = 30^\circ \text{ olur.}$$

Karışık Örnekler

$$1. \quad \frac{1}{1 - \sin x} + \frac{1}{1 + \sin x} = \frac{8}{3}$$

denklemini sağlayan x dar açısı kaç derecedir?

Çözüm: payda eşitlenir.

$$\frac{1 + \sin x + 1 - \sin x}{(1 + \sin x)(1 - \sin x)} = \frac{8}{3} \Rightarrow \frac{2}{1 - \sin^2 x} = \frac{8}{3}$$

$$\Rightarrow \cos^2 x = \frac{3}{4}$$

$$\cos x = \pm \frac{\sqrt{3}}{2} \Rightarrow$$

$$\cos x = \frac{\sqrt{3}}{2} \Rightarrow x = 30^\circ$$

$$2. \quad \pi < x < 2\pi$$

$\cos 2x + \sin x = 0$ denkleminin kaç kökü olabilir?

Çözüm: $\cos 2x$ in açılımının $\sin x$ cinsinden yazmalıyız.

$$1 - 2\sin^2 x + \sin x = 0 \Rightarrow 2\sin^2 x - \sin x - 1 = 0$$

$$2\sin x \quad +1$$

$$\sin x \quad -1$$

$$(2\sin x + 1)(\sin x - 1) = 0 \Rightarrow \sin x = -\frac{1}{2} \text{ veya } \sin x = 1$$

$$x = 210, 330, x = 90$$

210, 330 olabilir.

$$3. \quad 2\sin x + \sin 2x = 0 \Rightarrow x \in [0, 2\pi] \text{ aralığında kaç kökü vardır?}$$

Çözüm: $2\sin x + 2\sin x \cos x = 0$

$$2\sin x[1 + \cos x] = 0 \Rightarrow \sin x = 0 \rightarrow x_1 = 0, 180, 360$$

$$1 + \cos x = 2 \Rightarrow \cos x = -1$$

$$x_2 = 180$$

$$\Rightarrow \text{Ç.K} = \{0, 180, 360\} \text{ 3 tane}$$

4. $\frac{\cos^2 x}{1 + \sin x} = \frac{1}{2} \Rightarrow x$ dar açısı kaç derece olabilir?

Çözüm:

$$2\cos^2 x = 1 + \sin x$$

$$2\cos^2 x - 1 = \sin x$$

$$\cos 2x = \sin x \Rightarrow \sin x = \sin(90 - 2x)$$

$$x = 90 - 2x + 2k\pi \Rightarrow 3x = 90 + 2k\pi$$

$$x = 180 - [90 - 2x] + 2k\pi$$

$$x = 30 + \frac{2k\pi}{3}$$

$$-x = 90 + 2k\pi$$

$$x = -90 - 2k\pi \text{ ise}$$

$x = 30^\circ$ olabilir.

5. $1 + \cos x = \sin x + \tan x \Rightarrow x \in [0, \pi]$ de kaç kökü vardır?

Çözüm:

$$1 + \cos x = \sin x + \frac{\sin x}{\cos x}$$

$$1 + \cos x = \frac{\sin x \cos x + \sin x}{\cos x} \Rightarrow$$

$$\cos x + \cos^2 x = \sin x [\cos x + 1]$$

$$\cos x [1 + \cos x] = \sin x [\cos x + 1]$$

sadeleştirme yapılmaz.

$$\Rightarrow \cos x [1 + \cos x] - \sin x [\cos x + 1] = 0$$

$$[1 + \cos x][\cos x - \sin x] = 0 \Rightarrow \cos x = -1 \text{ ve } \cos x = \sin x$$

$$x = 180^\circ \quad \tan x = 1$$

$$x = 45$$

2 kökü vardır.

6. $2\sin^2 x - 3\cos x = 3 \Rightarrow$ ve $[0, 2\pi]$ aralığındaki kökleri bulun?

Çözüm:

$$2(1 - \cos^2 x) - 3\cos x - 3 = 0$$

$$2 - 2\cos^2 x - 3\cos x - 3 = 0$$

$$2\cos^2 x + 3\cos x + 1 = 0 \quad (2\cos x + 1)(\cos x + 1) = 0$$

$$2\cos x + 1 = 0 \quad \cos x = -1/2 \quad \cos x = -1$$

$$\cos x = -1$$

$$\text{ÇK} = \{120, 180, 240\}$$

7. $\frac{1}{\sin x} - \frac{1}{\cos x} = 1 \Rightarrow x$ in çözüm kümesini bulunuz?

Çözüm:

$$\frac{1}{\sin x} - \frac{1}{\cos x} = 1 \quad \frac{\cos x - \sin x}{\sin x \cdot \cos x} = 1$$

$$\cos x - \sin x = \sin x \cdot \cos x$$

(Her iki tarafın karesini alalım.)

$$\cos^2 x - 2\sin x \cos x + \sin^2 x = \sin^2 x \cdot \cos^2 x$$

$$1 - \sin 2x = \frac{\sin^2 2x}{4} \Rightarrow \sin^2 2x - 4\sin 2x + 4 = 0$$

$$(\sin 2x - 2)^2 = 0$$

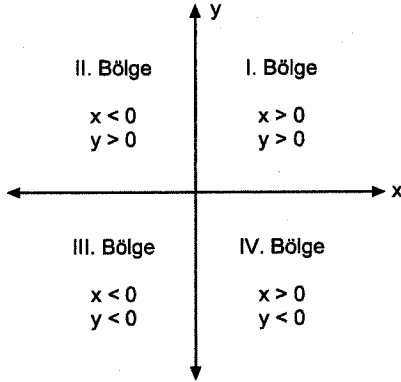
$$\sin 2x = 2$$

$$\text{Ç.K} = \{ \} \text{ dir.}$$

ANALİTİK GEOMETRİ

Noktanın Analitik İncelenmesi

1.

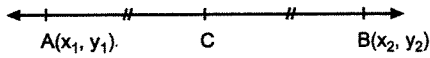


2. İki Nokta Arasındaki Uzaklık:

$A(x_1, y_1)$ $B(x_2, y_2)$

$$|AB| = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

3. Orta Nokta:

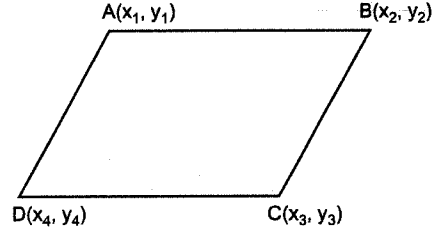


$$C\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

4. $A(x_1, y_1)$, $B(x_2, y_2)$, $C(x_3, y_3)$ köşeleri A, B, C olan bir üçgenin ağırlık merkezinin koordinatları

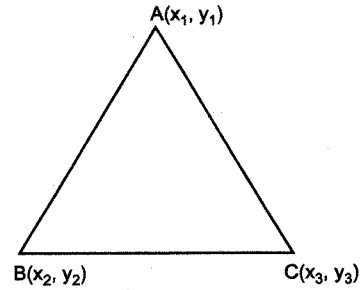
$$G\left(\frac{x_1 + x_2 + x_3}{3}, \frac{y_1 + y_2 + y_3}{3}\right)$$

5. Paralelkenar



$$\begin{aligned} x_1 + x_3 &= x_2 + x_4 \\ y_1 + y_3 &= y_2 + y_4 \end{aligned}$$

6.



$$\text{Alan}(\triangle ABC) = \frac{1}{2} \begin{vmatrix} x_1 & y_1 \\ x_2 & y_2 \\ x_3 & y_3 \end{vmatrix} = \dots\dots\dots$$

(Bu açılımı hocana sor.)

Eğim: Bir doğrunun Ox eksenine ile pozitif yönde yaptığı açının tanjantıdır.

a) İki noktası bilinen doğrunun eğimi:

$A(x_1, y_1)$, $B(x_2, y_2)$

$$m_{AB} = \frac{y_2 - y_1}{x_2 - x_1}$$

b) Eğimi ve bir noktası bilinen doğrunun denklemi:

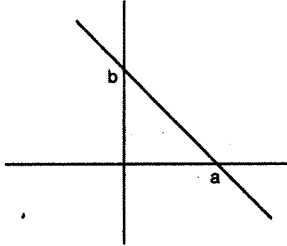
$$y - y_1 = m(x - x_1)$$

c) İki noktası bilinen doğrunun denklemi:

$$A(X_1, Y_1), B(X_2, Y_2)$$

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{y - y_1}{x - x_1}$$

d) Eksenleri kestiği noktaları bilinen doğrunun denklemi:



$$\frac{x}{a} + \frac{y}{b} = 1$$

Bilinmesi gereken bazı kurallar

* $ax + by + c = 0$ doğrusunun eğimi $-\frac{a}{b}$ dir.

* $y = mx + n$ doğrusunun eğimi m dir.

* İki doğru birbirine paralel ise eğimleri eşittir.

$$d_1 \parallel d_2 \Rightarrow m_1 = m_2$$

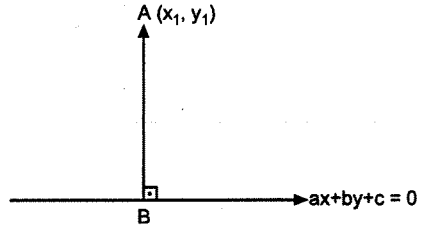
* İki doğru birbirine dik ise eğimleri çarpımı -1 e eşittir.

$$d_1 \perp d_2 \Rightarrow m_1 \cdot m_2 = -1$$

* Bir doğru bir noktadan geçiyorsa bu nokta bu doğruyu sağlar.

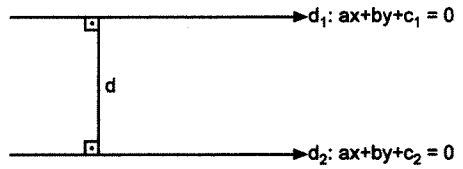
* İki doğrunun kesim noktası, iki denklem ortak çözümlerle bulunur veya yok etme yöntemi ile x ve y bulunur. Bulunan x ve y $A(x, y)$ gibi bir noktadır.

Bir noktanın bir doğruya olan uzaklığı



$$|AB| = \frac{|a \cdot x_1 + b \cdot y_1 + c|}{\sqrt{a^2 + b^2}}$$

* Paralel iki doğru arasındaki uzaklık:

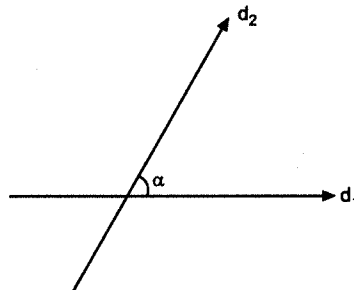


$$d = \frac{|c_1 - c_2|}{\sqrt{a^2 + b^2}}$$

İki Doğrunun Açılış Denklemleri

$$\frac{|a_1 x + b_1 y + c_1|}{\sqrt{a_1^2 + b_1^2}} = \frac{|a_2 x + b_2 y + c_2|}{\sqrt{a_2^2 + b_2^2}}$$

İki Doğru Arasındaki Açının Tanjantı

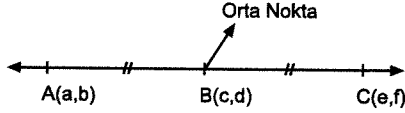


$$\tan \alpha = \frac{m_2 - m_1}{1 + m_1 \cdot m_2}$$

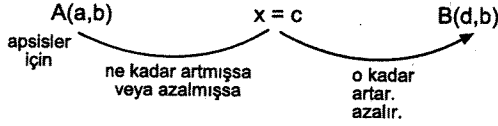
SİMETRİ

$A(a,b)$ noktasının;

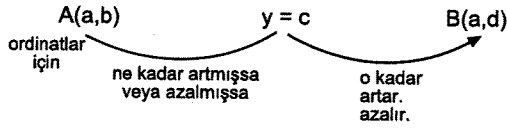
- * Orijine göre simetriği $B(-a, -b)$
- * $y = x$ 'e göre simetriği $B(b, a)$
- * $y = -x$ 'e göre simetriği $B(-b, -a)$
- * Ox 'e göre simetriği $B(a, -b)$
- * Oy 'e göre simetriği $B(-a, b)$
- * $A(a,b)$ noktasının $B(c,d)$ 'ye göre simetriği $C(e,f)$ ise



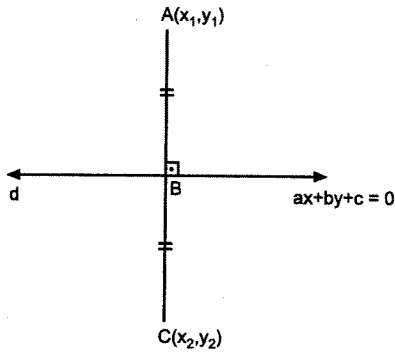
- * $A(a,b)$ noktasının $x = c$ 'ye göre simetriği;



- * $A(a,b)$ noktasının $y = c$ 'ye göre simetriği;

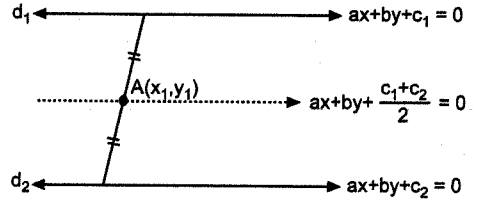


Bir noktanın bir doğruya göre simetriği



- a) A noktasının d doğrusuna göre simetriği $C(x_2,y_2)$ dir.
- b) B, A ile C'nin orta noktasıdır.
- c) B noktası d doğrusunu sağlar.
- d) $[AC] \perp d$ olduğundan $m_{AC} \cdot m_d = -1$ (eğimleri çarpımı)
- e) A noktasının d doğrusuna olan uzaklığının iki katı A ile C noktaları arasındaki uzaklıktır.

Bir doğrunun bir noktaya göre simetriği



Bir doğrunun bir noktaya göre simetriği alınırken x ve y'nin katsayılarını değiştirmeden bir doğru seçilir. d_1 ile d_2 doğruları A noktasına eşit uzaklıktadır. d_1 ile d_2 doğrularının sabit noktaları toplamının yarısı x ve y'nin katsayılarını değiştirmeden bir doğru seçilir ve A noktası bir doğruyu sağlayacağından sabit nokta bulunur ve simetri alınmış olur.

Pratik Simetriler

$ax+by+c = 0$ doğrusunun;

- a) $y = x$ 'e göre simetriği
Doğruda
x yerine y, y yerine x yazılarak bulunur.
- b) $y = -x$ 'e göre simetriği
Doğruda
x yerine $-y$, y yerine $-x$ yazarak bulabiliriz.
- c) Ox 'e göre simetriği y'nin önündeki işaret değişir.
 $ax-by+c = 0$
- d) Oy 'e göre simetriği: x'in önündeki katsayının işareti değişir. $-ax+by+c = 0$
- e) Bir doğrunun $y = x+2$, $y = -x+2$ gibi eğimleri 1 veya -1 olan doğrulara göre simetriğinde.
Örneğin; bir doğrunun $y = x+2$ doğrusuna göre simetriğini bulalım.
Doğruda y yerine $x+2$, x yerine ise $y-2$ yazarak bulabiliriz.
- f) $d_1 \perp d_2 \Rightarrow d_1$ doğrusunun d_2 doğrusuna göre simetriği kendisidir. (yani d_1 dir.)

1. $A(a, -b)$ 2. bölgede ise
 $B(-b, -a)$ kaçınıcı bölgededir?

Cevap: 1

5. $A(a^2-b^2, a-b)$ 2. bölgede ise
 $B(a-b, a+b)$ kaçınıcı bölgededir?

Cevap: 4. bölge

2. $A(a^2b, a+b)$ 2. bölgede ise
 $B(-a, b)$ kaçınıcı bölgededir?

Cevap: 3

6. $A(2m-8, m+1)$ 2. bölgede ise
 A noktalarından orjine en yakın olanı hangisidir?

Cevap: $(-2, 4)$

3. $A(a.b, a^2+b)$ 3. bölgede ise
 $B(\frac{a}{b}, a-b)$ kaçınıcı bölgededir?

Cevap: 2

7. $A(2m-8, m+6)$ 2. bölgede ise
 m nin tamsayı değerleri toplamı kaçtır?

Cevap: -9

4. $A(|2-a|, |2-a|)$ ($a \neq 2$)
kaçınıcı bölgededir?

Cevap: 1

8. $A(6; 4), B(-1, -10) \Rightarrow |AB| = ?$

Cevap: $7\sqrt{5}$

9. $A(-2, 3), B(3, -9) \Rightarrow |AB| = ?$

Cevap: 13

10. $A(a, 4), B(3, -20) |AB| = 25$
 $\Rightarrow a$ nın alabileceği değerler toplamı?

Cevap: 6

11. $A(a, a), B(4, 2), |AB| = 10$ ise
 a nın alabileceği değerler toplamı?

Cevap: 6

12. $A(m, 2), B(6, 2), C(9, -2)$
 $\Rightarrow |AB| = |AC|$ ise $m = ?$

Cevap: $\frac{61}{6}$

13. $A(0, 4), B(m, -4), C = (1, 2)$
 $\Rightarrow |AB| = |BC|$ ise $m = ?$

Cevap: $-\frac{27}{2}$

14. $A(6,4), B(9,2)$ noktaları Ox ekseninde C noktasına eşit uzaklıkta ise C 'nin apsisi?

Cevap: $\frac{11}{2}$

15. $A(-2,6), B(4,8)$ noktaları Oy ekseninde C noktasına eşit uzaklıkta ise C 'nin ordinatı kaçtır?

Cevap: 10

16. $A(m-2, m+4)$ noktası Ox ve Oy eksenine eşit uzaklıkta ise A noktası ne olabilir?

Cevap: $(-3, 3)$

17. $A(2,1)$ noktasının Ox ekseninde B noktasına uzaklığı $5\sqrt{2}$ br ise B nin apsisi toplamı?

Cevap: 4

18. $A(2,6)$ ve $B(-10,12)$ noktaları veriliyor $|AB|$ nin orta noktası nedir?

Cevap: $(-4, 9)$

19. $A(m,4)$, $B(-2,8)$ orta noktası Oy eksenı üzerinde ise $m = ?$

Cevap: 2

20. $A(6,m-2)$, $B(-2,4)$ noktaları için $|AB|$ nin orta noktası Ox eksenı üzerinde ise $m = ?$

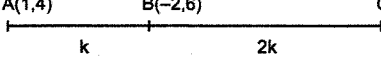
Cevap: -2

21. $A(m+n, 2m-n)$, $B(m-2, m+2)$ $[AB]$ nin orta noktası orjin ise, $(m, n) = ?$

Cevap: (0, 2)

22. $A(4,6)$, $B(-2,8)$, $C(2,4)$ noktaları ABC üçgeninin köşeleridir.
 $|AB|$ ye ait kenarortay uzunluęu kaçtır?

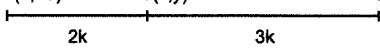
Cevap: $\sqrt{10}$

23. $A(1,4)$ $B(-2,6)$ $C(x,y)$
- 

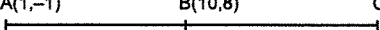
Cevap: (-8, 10)

24. $A(6,9)$ $B(-2,-1)$ $C(x,y)$
- 

Cevap: (-14, -16)

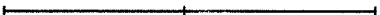
25. $A(4,10)$ $B(x,y)$ $C(24,20)$
- 

Cevap: (12, 14)

26. $A(1,-1)$ $B(10,8)$ $C(x,y)$
- 

$$\frac{|AC|}{|BC|} = \frac{3}{2}$$

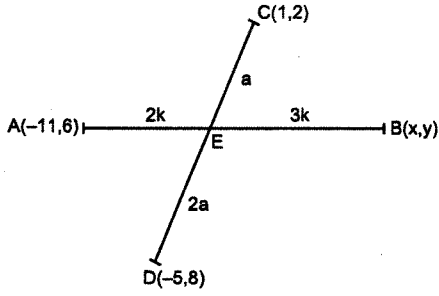
Cevap: (28,26)

27. $A(12,8)$ $B(10,8)$ $C(x,y)$
- 

$$\frac{|AC|}{|BC|} = \frac{4}{3}$$

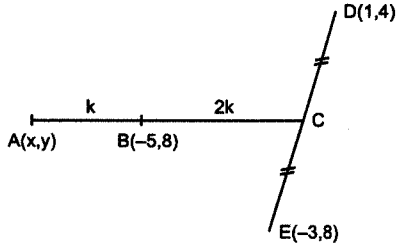
Cevap: (4,8)

28.



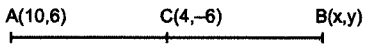
Cevap: (14,1)

29.



Cevap: (-7, 9)

30.



$$\frac{|AC|}{|BC|} = \frac{2}{3}$$

Cevap: (-5, -24)

31. A(1, 4), B(-2, 3), C(-2, 2)

üçgeninin ağırlık merkezinin koordinatlarını bulunuz?

Cevap: (-1, 3)

32. A(1, 4), B(-2, 3), C(-5, 5)

üçgeninin alanı kaç br^2 dir?

Cevap: $\frac{9}{2}$

33. A(a, 4), B(6, 2), C(-1, 3)

üçgeninin alanı $4 br^2$ ise a nın alabileceği değerler toplamı?

Cevap: -16

34. A(4, 8), B(-2, 6) ve ağırlık merkezi

G(1, 3) ise C(x, y) = ?

Cevap: (1, -5)

35. Köşeleri A(6, 4), B(-2, 12) ve C(x, y) olan bir üçgen için ağırlık merkezi x- ekseninde ise C'nin ordinatı kaçtır?

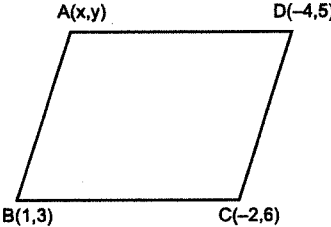
Cevap: -16

36. Köşeleri $A(1, 1)$, $B(-2, 4)$, $C(6, 9)$ ve $D(-4, -2)$ olan ABCD dörtgeninin alanı kaç br^2 dir?

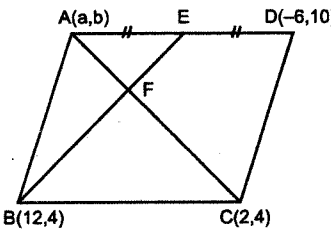
Cevap: 24

37. Köşeleri $A(1, 2)$, $B(4, -2)$, $C(6, 12)$ ve $D(x, y)$ olan paralelkenarın D köşesinin koordinatları kaçtır?

Cevap: (3, 16)

38.  Paralelkenarın A köşesinin koordinatlarını bulun.

Cevap: (-1, 2)

39.  F noktasının koordinatlarını bulunuz.

Cevap: $\left(\frac{10}{3}, 8\right)$

40. $A(4, 2)$, $B(-6, 10)$ noktalarından geçen doğru-
nun eğimi nedir?

Cevap: $-\frac{4}{5}$

41. $A(-2, m)$, $B(4, 2)$ noktalarından geçen doğru-
nun eğimi 2 ise $m=?$

Cevap: -10

42. $A(2,k)$, $B(-1,4)$, $C(6,-2)$

noktaları aynı doğru üzerinde ise $k=?$

Cevap: $\frac{10}{7}$

43. $A(4,2)$ noktasından geçen ve eğimi $\frac{1}{2}$ olan
doğrunun denklemi?

Cevap: $y = \frac{x}{2}$

44. A(-2,4) ve B(6,m) noktalarından geçen doğrunun eğimi m ise, m=?

Cevap: $-\frac{4}{7}$

45. A(4,6) noktasından geçen doğrunun denklemi $y=4x+m$ ise, m=?

Cevap: -10

46. A(-2,3) noktasından geçen doğrunun denklemi $y=mx+4$ ise, m=?

Cevap: $\frac{1}{2}$

47. A(6,k) noktasından geçen doğrunun denklemi $y=2x+4$ ise, k=?

Cevap: 16

48. $y=2x-m$ doğrusu üzerindeki noktalar A(1,m) ve B(m,n) ise, n=?

Cevap: 1

49. $y=4x$ doğrusu üzerindeki nokta A(k,k+6) ise, k=?

Cevap: 2

50. $y=2x+3$ doğrusu üzerindeki noktaların en genel gösterimi nasıl olabilir?
 $a \in \mathbb{R}$

Cevap: $(a, 2a+3)$

51. $x=2y-6$ doğrusu üzerindeki noktaların en genel gösterimi nasıl olabilir?

Cevap: $(2m-6, m)$

52. Eğimi 2 ve A(1,4) noktasından geçen doğrunun x eksenini kestiği nokta nedir?

Cevap: $(-1, 0)$

53. Eğimi 3 ve A(4,18) noktasından geçen doğrunun y eksenini kestiği noktanın ordinatı?

Cevap: 6

54. Eğimi $\frac{3}{4}$ ve A(2,6) noktasından geçen doğrunun eksenlerle oluşturduğu bölgenin alanı?

Cevap: $\frac{27}{2}$

55. $2x+3y-12=0$ doğrusunun Ox ve Oy'yi kestiği noktalar arası uzaklık kaç br dir?

Cevap: $2\sqrt{13}$

56. A(4,2), B(6,-2) noktalarından geçen doğrunun denklemi nedir?

Cevap: $y+2x-10=0$

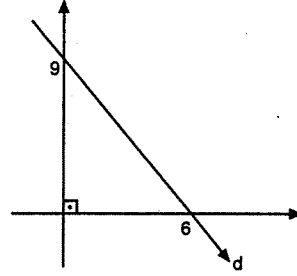
57. A(-2,1), B(2,6) noktasından geçen doğrunun denklemi nedir?

Cevap: $4y-5x-14=0$

58. A(6,4) ve B(-2,8) noktalarından geçen doğrunun x eksenini kestiği nokta ile y eksenini kestiği nokta arasındaki uzaklık kaç br dir?

Cevap: $7\sqrt{5}$

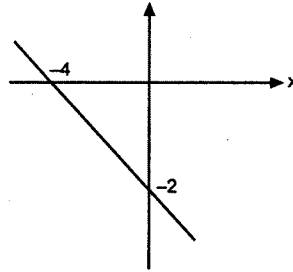
59.



Doğrunun denklemini bulunuz?

Cevap: $3x+2y-18=0$

60.



Doğrunun denklemini bulunuz?

Cevap: $x+2y+4=0$

61. Ox eksenini 4'te Oy eksenini 3'te kesen doğrunun denklemini bulunuz?

Cevap: $3x+4y-12=0$

62. Ox'i 6 Oy'yi -8 de kesen doğrunun eğimi kaçtır?

Cevap: $\frac{4}{3}$

63. Ox i A da Oy yi B de kesen doğru için $|AB|=13$ ve eğimi $-\frac{12}{5}$ ise doğrunun denklemi ne olabilir?

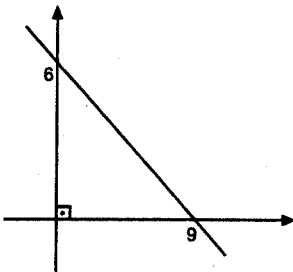
Cevap: $-12x+5y-60=0$

64. $ax+by+c=0$ doğrusunun Ox i kestiği nokta 6, Oy yi kestiği nokta -8 ise C kaç olabilir?

Cevap: -24

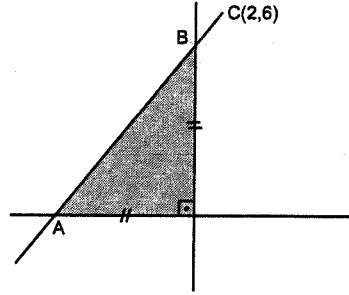
65. Ox i 4, Oy yi -3 te kesen doğru A(1,m) noktasından geçtiğine göre m kaç olur?

Cevap: $-\frac{9}{4}$

66.  eğimi?

Cevap: $-\frac{2}{3}$

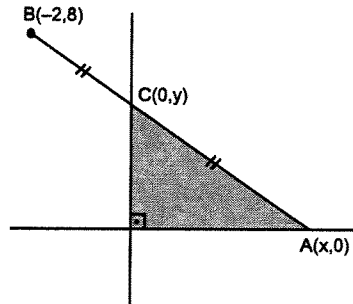
67.



T.A=?

Cevap: 8

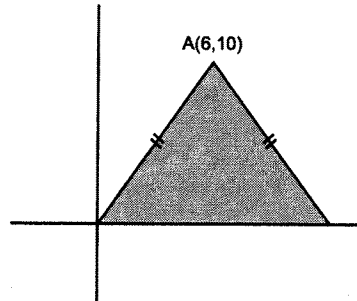
68.



T.A=?

Cevap: 4

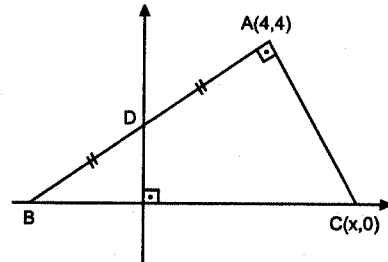
69.



T.A=?

Cevap: 60

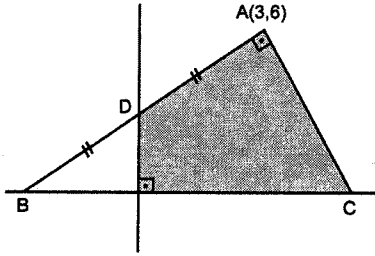
70.



x=?

Cevap: 6

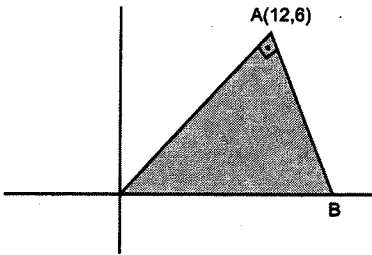
71.



T.A=?

Cevap: $\frac{63}{2}$

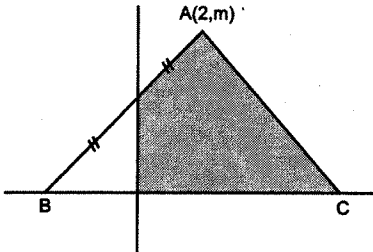
72.



T.A=?

Cevap: 45

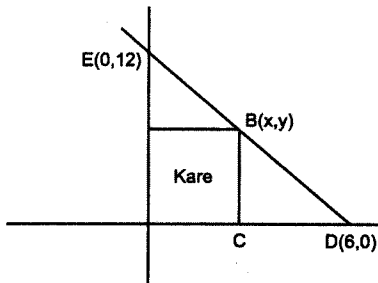
73.



ABC
eşkenar
üçgen
T.A=?

Cevap: $14\sqrt{3}$

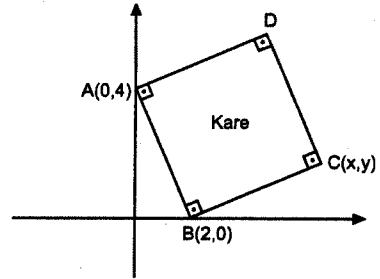
74.



x+y=?

Cevap: 8

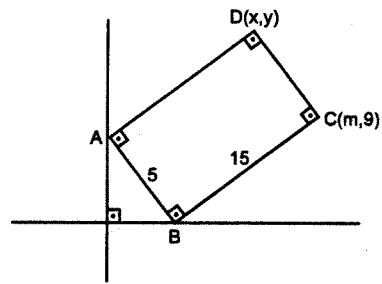
75.



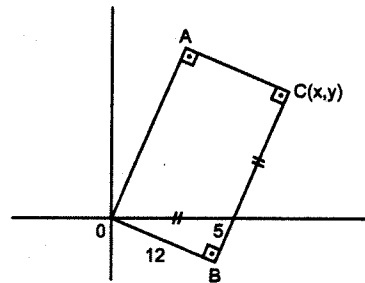
x+y=?

Cevap: 8

76.

 $\frac{x+y}{m}=?$ Cevap: $\frac{5}{3}$

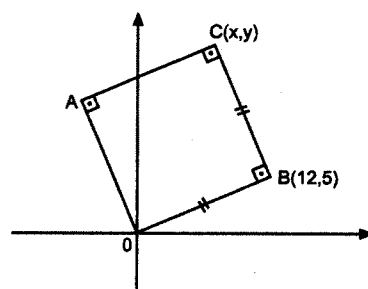
77.



x+y=?

Cevap: 30

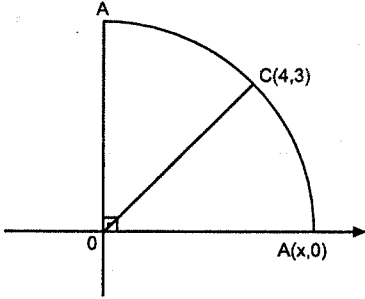
78.



x+y=?

Cevap: 24

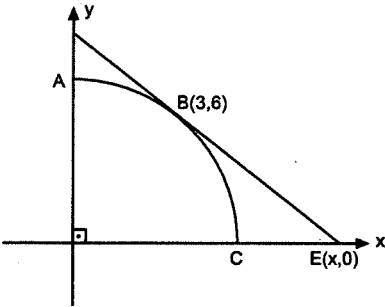
79.



$x = ?$

Cevap: 5

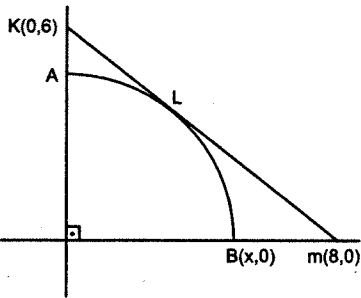
80.



$x = ?$

Cevap: 15

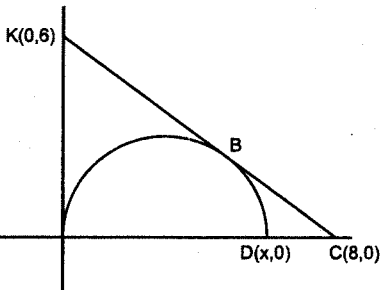
81.



$x = ?$

Cevap: $\frac{24}{5}$

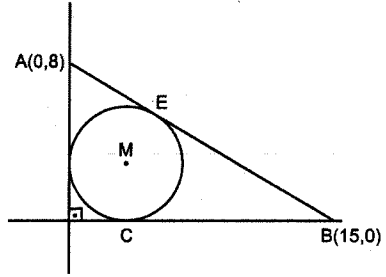
82.



$x = ?$

Cevap: 6

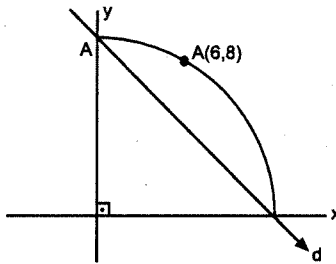
83.



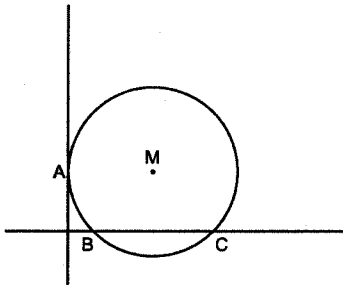
$m(x,y)=?$

Cevap: (3,3)

84.

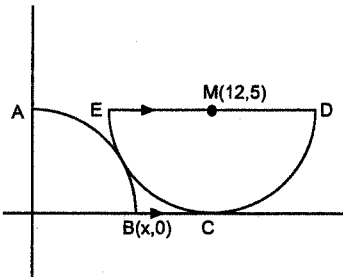
d doğrusunun
denklemini
bulunuz.Cevap: $x+y-10=0$

85.

B(2,0)
C(8,0)
 $m(x,y) = ?$

Cevap: (5,4)

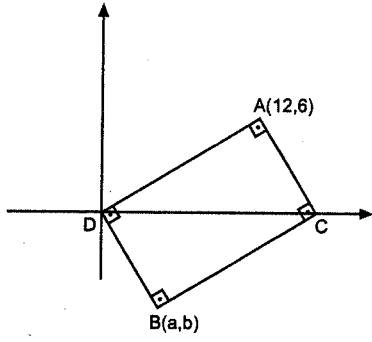
86.



$x = ?$

Cevap: 8

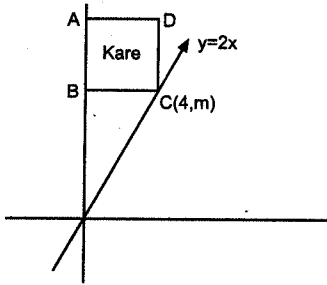
87.



$$a-b = ?$$

Cevap: 9

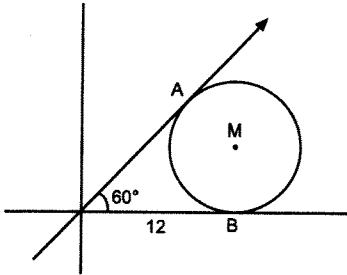
88.



D noktasının koordinatları?

Cevap: (4, 12)

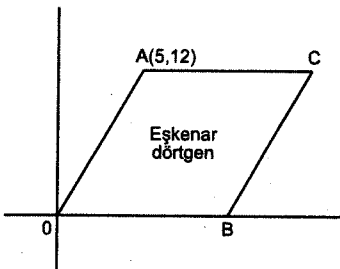
89.



$$M(x, y) = ?$$

Cevap: $(12, 4\sqrt{3})$

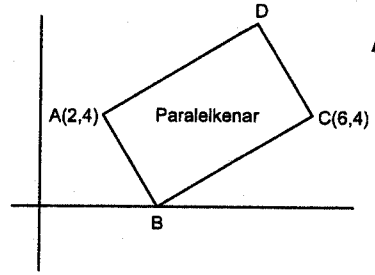
90.



AOBC eşkenar dörtgenin ağırlık merkezinin koordinatları nedir?

Cevap: (9, 6)

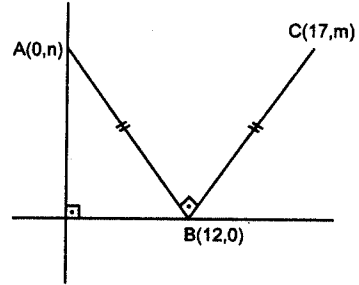
91.



$$A(ABCD) = ?$$

Cevap: 16

92.

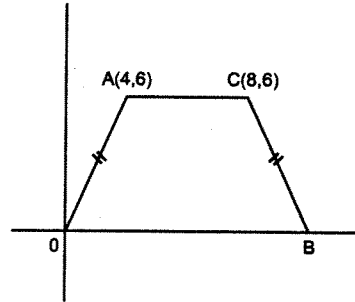


$$m = ?$$

$$n = ?$$

Cevap: $m = 12$
 $n = 5$

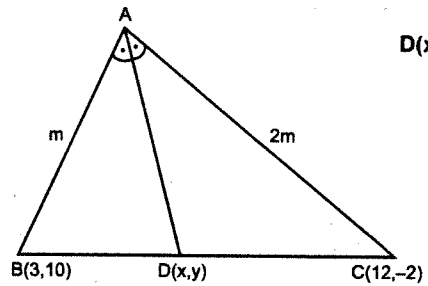
93.



$$A(ABCD) = ?$$

Cevap: 48

94.



$$D(x, y) = ?$$

Cevap: (6, 6)

95. $2x+3y+6=0$ doğrusunun eğimi?

Cevap: $-\frac{2}{3}$

96. $ax+3y-5=0$ doğrusunun eğimi $\frac{2}{3}$ ise

$a = ?$

Cevap: -2

97. $2x-3y+6=0$ doğrusu $3x-my+n=0$ doğrusuna paralel ise, $a = ?$

Cevap: $\frac{9}{2}$

98. $-2x+y+6=0$ doğrusu $3x+ay=0$ doğrusuna paralel ise, $a = ?$

Cevap: $-\frac{3}{2}$

99. $d_1: ax+2y-3=0$

$d_2: (a-1)x+4y-6=0$

$d_1 \parallel d_2 \Rightarrow a = ?$

Cevap: -1

100. $d_1: ax+4y-5=0$

$d_2: 2x-3y+1=0$

doğruları birbirine dik
ise $a = ?$

Cevap: 6

101. $(a+1)x-(a+1)y-2=0$

$d_2: ax+y-1=0$

$d_1 \perp d_2 \Rightarrow a = ?$

Cevap: 1

102. $2x+3y-5=0$ doğrusuna paralel ve $A(1,2)$ noktasından geçen doğrunun denklemi nedir?

Cevap: $2x + 3y - 8 = 0$

103. $x-2y-2=0$ doğrusuna paralel ve $A(2,6)$ noktasından geçen doğrunun denklemi nedir?

Cevap: $x - 2y + 10 = 0$

104. $2x-y+6=0$ doğrusuna dik ve $A(1,2)$ noktasından geçen doğrunun denklemi?

Cevap: $x + 2y - 5 = 0$

105. $3x-y+6=0$ doğrusu üzerindeki $A(3,k)$ noktasında dik kesişen doğrunun denklemi?

Cevap: $x+3y-48=0$

106. $2x+y-6=0$ doğrusu ile Ox ekseninde dik kesişen doğrunun denklemi?

Cevap: $2y-x+3=0$

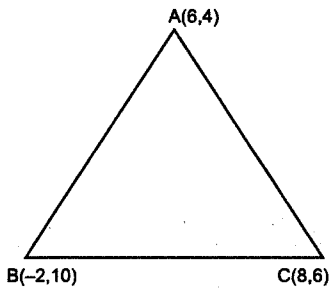
107. $3x-4y+12=0$ doğrusu ile Oy ekseninde dik kesişen doğrunun denklemi?

Cevap: $3y+4x-9=0$

108. $2x-y+6=0$ doğrusu ile Oy ekseninde dik kesişen doğrunun denklemi?

Cevap: $x+2y-12=0$

109.



$|BC|$ ye ait kenar ortayın denklemi

Cevap: $3y+4x-36=0$

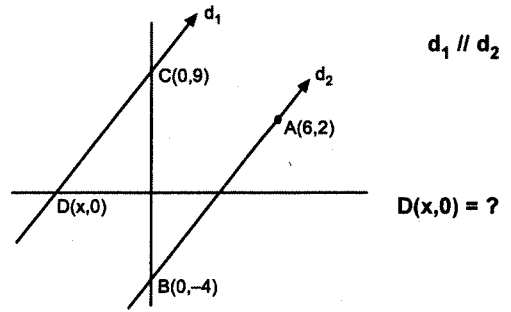
110. 109. sorudaki şekil için A dan geçen $|BC|$ ye paralel olan doğrunun denklemi?

Cevap: $5y+2x-32=0$

111. 109. sorudaki şekil için A dan geçen $|BC|$ ye dik olan doğrunun denklemi?

Cevap: $2y-5x+22=0$

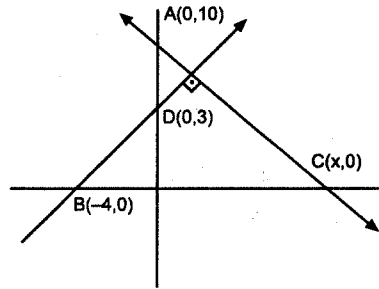
112.



$D(x,0) = ?$

Cevap: $(-9,0)$

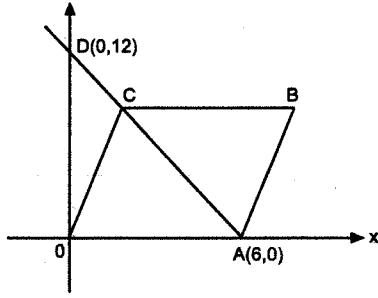
113.



$x = ?$

Cevap: $\frac{15}{2}$

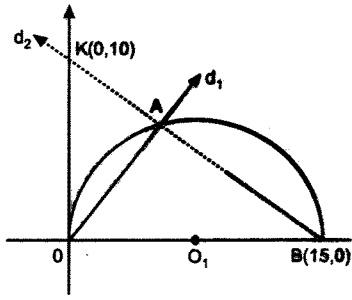
114.



COAB
eşkenar
dörtgen
|OB| nin
denklemleri

Cevap: $y = \frac{x}{2}$

115.



d_1 in eğimi

Cevap: $\frac{3}{2}$

116.

$x-y+6=0$ ve $x+y-4=0$

doğrularının kesim noktasını bulunuz?

Cevap: $(-1,5)$

117.

$2x-y+6=0$, $3x+y+m=0$

doğrularının kesim noktası $(2,k)$ ise $m = ?$

Cevap: -16

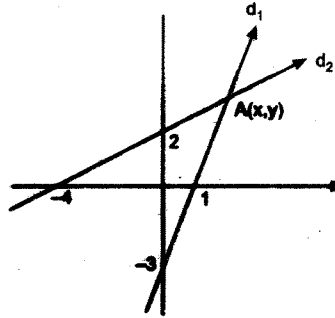
118.

$x+y-2=0$, $2x-y+8=0$

doğrularının kesim noktasından geçen ve $3x-y+6=0$ doğrusuna paralel olan doğrunun denklemi?

Cevap: $y=3x+10$

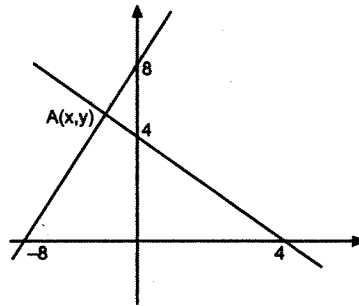
119.



$A(x,y) = ?$

Cevap: $(2,3)$

120.



$A(x,y) = ?$

Cevap: $A(-2,6)$

121.

$x-y+3=0$
 $2x+y-12=0$

doğrularının kesim noktasından geçen ve $2x+3y-4=0$ doğrusuna dik olan doğrunun denklemi?

Cevap: $2y-3x-3=0$

122. $3x - y + 4 = 0$
 $x + y - 12 = 0$
 $mx + 2y - 10 = 0$

doğruları aynı noktada kesişiyor ise $m = ?$

Cevap: -5

123. $4x - y - 12 = 0$
 $x + y + n = 0$

doğruları Ox ekseninde kesişiyor ise $n = ?$

Cevap: -3

124. $3x + 4y + 24 = 0$
 $3x + ay - 18 = 0$

doğruları Oy ekseninde kesişiyor ise $a = ?$

Cevap: -3

125. $ax + 2y - 8 = 0$ ve
 $mx + y + 4 = 0$

doğruları dik kesişiyor ise kesim noktasının orjine olan uzaklığı kaç br dir?

Cevap: 4

126. $4x + 3y + 24 = 0$
 $ax + 3y - 6 = 0$

doğruları $x = 2$ doğrusu üzerinde kesişiyor ise $a = ?$

Cevap: 19

127. $2x - 3y + 12 = 0$
 $x + my - 2 = 0$

doğruları $y = 4$ doğrusu üzerinde kesiştiğine göre $m = ?$

Cevap: $\frac{1}{2}$

128. $2x - y + 12 = 0$
 $ax + 3y - 4 = 0$

doğruları $y = x$ doğrusu üzerinde kesiştiğine göre $a = ?$

Cevap: $-\frac{10}{3}$

129. $13x + 5y - 18 = 0$
 $7x + 3y + 9 = 0$

doğrularının kesim noktasından ve orjinden geçen doğrunun eğimi?

Cevap: $-\frac{27}{11}$

130. $16x - 17y + 4 = 0$
 $9x + 28y - 8 = 0$

doğrularının kesim noktasından ve orjinden geçen doğrunun eğimi kaçtır?

Cevap: $\frac{41}{6}$

131. $-2 \leq x \leq 4$
 $-3 \leq y \leq 0$

doğrularının sınırlandığı bölgenin alanı kaç br^2 dir?

Cevap: 18

132. $|x| \leq 4$
 $|y-2| \leq 3$

doğrularının sınırlandığı bölgenin alanı?

Cevap: 48

133. $y-x+6=0$
 $y+x-4=0$

ve Ox ekseninde kalan bölgenin alanı?

Cevap: 1

134. $2x+y+12=0$
 $x-y+3=0$

ve Oy ekseninde kalan bölgenin alanı?

Cevap: $\frac{75}{2}$

135. $3x+y-18=0$
 $x-y-8=0$

doğrularının eksenlerle oluşturduğu bölgenin alanı?

Cevap: $\frac{61}{2}$

136. $x-y-4=0$
 $x+y+6=0$
 $x=6$

doğrularının sınırlandığı bölgenin alanı?

Cevap: 49

137. $2x-3y-6=0$
 $x=4$
Ox

doğrularının sınırlandığı bölgenin alanı?

Cevap: $\frac{1}{3}$

138. $3x-4y-12=0$
 $y=6$
Oy

doğrularının sınırlandığı bölgenin alanı?

Cevap: 54

139. $6x-y+12=0$
 $x+y+2=0$

doğruları ve Oy ekseninde kalan bölgenin alanı kaç birim karedir?

Cevap: 14

140. $y \geq 2x$
 $y \leq -x$
 $x \leq 6$

ile sınırlanan bölgenin alanı?

Cevap: 54

141. $(m-1)x + (n+1)y - 2 = 0$
 $2x - 3y + 6 = 0$

doğruları çakışık ise $m+n=?$

Cevap: $\frac{1}{3}$

142. $(m+1)x - (2m-6)y + 16 = 0$

doğrularının geçtiği sabit nokta?

Cevap: $(-4, -2)$

143. $(m+1)x - (2m-6)y + 16 = 0$

doğrularının kesim noktasından geçen doğru $2x-3y+k=0$ ise $k=?$

Cevap: 2

144. $x-(m+1)y-12=0$

doğrularının kesim noktasının Oy ye olan uzaklığı kaç brdir?

Cevap: 12

145. $(m-3)x + (m-4)y - 12 = 0$

doğrularının kesim noktasından geçen ve $2x-3y-6=0$ doğrusuna paralel olan doğrunun denklemi?

Cevap: $2x-3y-60=0$

146. $(2m-6)x + (m+1)y - 16 = 0$

doğrularının kesim noktasından geçen $x-y-2=0$ doğrusuna dik olan doğrunun denklemi?

Cevap: $x+y-2=0$

147. $mx + (m-2)y - 4m + 12 = 0$

doğrularının kesim noktası ve orjinden geçen doğrunun denklemi?

Cevap: $3x+y=0$

148. $(m+1)x - (m-2)y - 4m + 20 = 0$

doğrularının kesim noktasından geçen ve $x=2$ ye paralel olan doğrunun denklemi?

Cevap: $x=-4$

149. $(m-6)x + 12(m-1)y - 12 = 0$

doğrularının kesim noktasından geçen ve $y=2$ ye paralel olan doğrunun denklemi?

Cevap: $y = \frac{1}{5}$

150. $A(m-1, m+1)$

noktalarının belirttiği doğrunun denklemi?

Cevap: $x-y+2=0$

151. $A(m+1, 2m-3)$

noktalarının geçen doğrunun denklemi?

Cevap: $2x-y-5=0$

152. $A(k-2, 2k+1)$

noktalarından geçen doğrunun eksenlerle oluşturduğu bölgenin alanı?

Cevap: $\frac{25}{4}$

153. $A\left(\frac{k+1}{2}, 3k\right)$

noktalarının geometrik yer denklemini bulunuz?

Cevap: $y=6x-3$

154. $A(4m-1, 2m+6), B(3m-8, m)$

noktalarının orta noktasının geometrik yer denklemini bulunuz?

Cevap: $6x-14y+69=0$

155. $A(t, 2t-2)$ noktalarından geçen doğru $y=ax$ doğrusuna paralel ise $a=?$

Cevap: 2

156. $A(2p, p-4)$ noktalarından geçen doğru $y+ax-5=0$ doğrusuna dik ise $a=?$

Cevap: 2

157. $A(m-2, m+1)$ noktalarının oluşturduğu doğru ile $B(t+2, t-1)$ noktalarının oluşturduğu doğrusunun kesim noktası nedir?

Cevap: Boş küme

158. $A(1, 5)$ noktasının, $3x-4y+8=0$ doğrusuna olan uzaklığı kaç br?

Cevap: $\frac{9}{5}$

159. $A(-2, 5)$ noktasının $5x+12y+15=0$ doğrusuna olan uzaklığı kaç br dir?

Cevap: 5

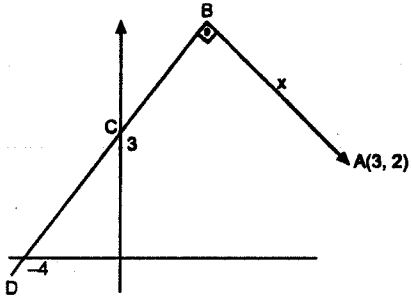
160. $A(m, 2)$ noktasının $x-y+6=0$ doğrusuna olan uzaklığı $2\sqrt{2}$ br ise m nin alabileceği değerler?

Cevap: $\{0, -8\}$

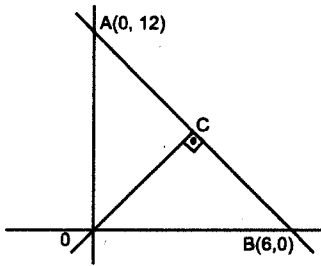
161. $A(4, 6)$ noktasının $3x+4y+m=0$ doğrusuna olan uzaklığı 2 ise m kaç olabilir?

Cevap: $\{-26, -46\}$

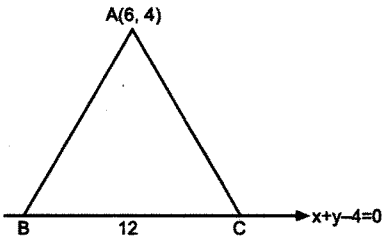
162.

 $x = ?$ Cevap: $\frac{13}{5}$

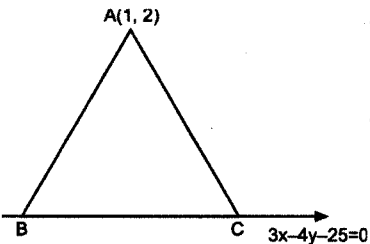
163.

 $|OC| = ?$ Cevap: $\frac{12}{\sqrt{5}}$

164.

Alan($\triangle ABC$)Cevap: $18\sqrt{2}$

165.

ABC
eşkenar $A(ABC) = ?$ Cevap: $12\sqrt{3}$ 166. $2x-3y-3=0$

$2x-3y-16=0$

doğrular arasındaki uzaklık?

Cevap: $\sqrt{13}$ 167. $d_1: 2x+3y+6=0$ $d_1 \parallel d_2$
 $d_2: (m-2)x+4y-8=0$ ise d_1 ile d_2 doğruları arasındaki uzaklık kaç br dir?Cevap: $\frac{12}{\sqrt{13}}$ 168. $x-y-2=0$

$x-y+m=0$

doğruları arasındaki uzaklık $\sqrt{2}$ br ise m kaç olabilir?Cevap: $m=0$
 $m=-4$ 169. $4x-3y+12=0$

$-8x+6y+24=0$

doğruları arasındaki uzaklık kaçtır?

Cevap: $\frac{24}{5}$ 170. $4x-3y-12=0$

$4x-3y+18=0$

doğruları arasındaki yerleştirilebilecek en büyük eşkenar üçgeninin alanı?

Cevap: $12\sqrt{3}$

171. $x-y-6=0$
 $x-y-16=0$

doğruları arasındaki yerleştirilebilecek en büyük karenin alanı?

Cevap: 50

172. $4x+3y-12=0$
 $4x+3y-42=0$

doğrularını 30° lik açıyla kesen doğrunun paralel doğrular arasındaki kalan doğru parçasının uzunluğu kaç br dir?

Cevap: 12

173. $x-2y-6=0$
 $2x+y-2=0$

doğrularının açıortay denkleminde biri nedir?

Cevap: $x+3y+4=0$

174. $4x-3y-12=0$ ile Ox

doğrularının açıortay denklemlerinden birinin eğimi kaçtır?

Cevap: $\frac{1}{2}$

175. $3x-y-6=0$
 $x-3y+12=0$

doğrularına eşit uzaklıkta bulunan noktaların geometrik yeri ne olabilir?

Cevap: $x+y-9=0$

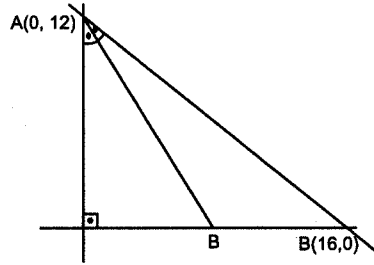
176. Eğimleri 2 ile $\frac{1}{2}$ olan doğruların açıortay denklemlerinden birinin eğimi kaç olabilir?

Cevap: 1

177. Eğimleri $\frac{3}{4}$ ile $\frac{4}{3}$ olan doğruların açıortay denklemlerinden birinin eğimi kaç olabilir?

Cevap: -1

178.



[AB] nin denklemi?

Cevap: $2x+y-12=0$

179. $\sqrt{3}x-y-6=0$
 $\sqrt{3}x+y-12=0$

doğrular arasındaki dar açı?

Cevap: 60

180. $\frac{\sqrt{3}}{3}x-y-12=0$
 $x-y-6=0$

doğruları arasındaki geniş açı?

Cevap: 165

181. $\sqrt{3}x - y = 0$

$x + y - 6 = 0$

doğrular arasındaki geniş açı?

Cevap: 105

182. $x - y - 4 = 0$

$x + y - 6 = 0$

doğrular arasındaki açı kaç derecedir?

Cevap: 90

183. $mx - 4y - 6 = 0$

$2x - y + 2 = 0$

doğrular arasındaki açı 45° ise $m = ?$

Cevap: -12

184. $2x - y - 6 = 0$

$3x + y + 4 = 0$

doğrular arasındaki geniş açının tanjantı?

Cevap: -1

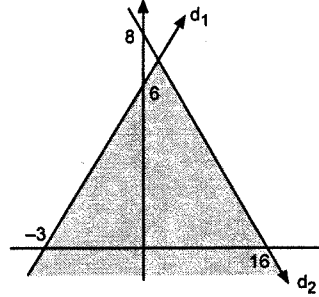
185. $ax - 2y + 6 = 0$

$4x - 2y - 2 = 0$

doğrular arasındaki açının tanjantı $\frac{3}{2}$ ise $a = ?$

Cevap: $-\frac{7}{2}$

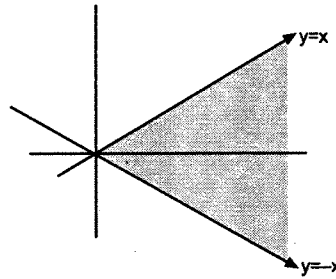
186.



Taralı bölgeyi ifade eden eşitsizlik sistemi nedir?

Cevap: $x + 2y - 16 \leq 0$
 $2x - y + 6 \geq 0$

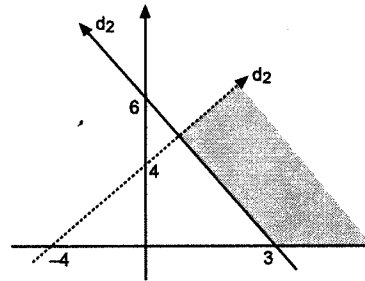
187.



Taralı bölgeyi ifade eden eşitsizlik sistemi nedir?

Cevap: $y \leq |x|$

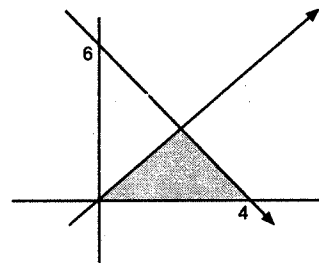
188.



Taralı bölgeyi ifade eden eşitsizlik sistemi nedir?

Cevap: $x - y + 4 > 0$
 $2x + y - 6 \geq 0$

189.



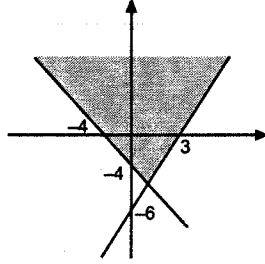
Taralı bölge nasıl ifade edilir?

Cevap: $y \leq x$
 $3x + 2y - 12 \leq 0$
 $xy \geq 0$

190. $2x - y - 6 \leq 0$
 $x + y + 4 \geq 0$

eşitsizliği analitik düzlemde gösterimi?

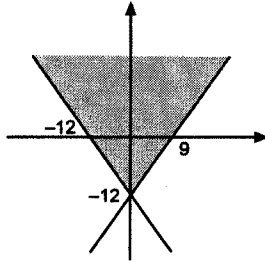
Cevap:



191. $4x - 3y - 36 \leq 0$
 $x + y + 12 \geq 0$

eşitsizliği analitik düzlemde gösterimi?

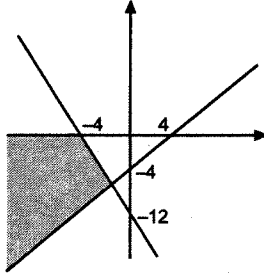
Cevap:



192. $3x + y + 12 \leq 0$
 $x - y - 4 \leq 0$
 $x, y \geq 0$

analitik düzlemde gösterimi?

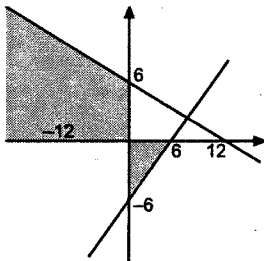
Cevap:



193. $y - x + 6 \geq 0$
 $2y + x - 12 \leq 0$
 $x, y \leq 0$

analitik düzlemde gösterimi?

Cevap:



194. $(x - y + 6) \cdot (x + y - 4) = 0$

doğrularının kesim noktasını bulunuz?

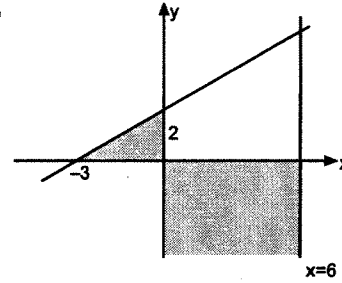
Cevap: $(-1, 5)$

195. $x^2 + y^2 - 2xy - 9 \leq 0$ ve $x, y \leq 0$

analitik düzlemde belirttiği bölgenin alanı?

(Cevap: 9)

196.



Taralı bölgeyi ifade edin?

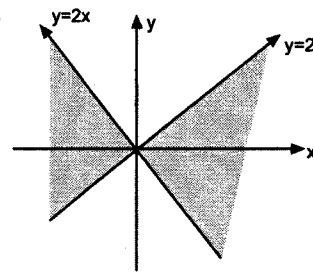
Cevap:

$2x - 3y + 6 \geq 0$

$x \leq 6$

$x, y \leq 0$

197.

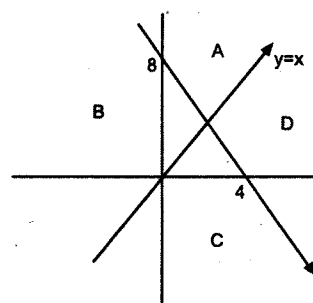


Taralı bölgeyi ifade edin?

Cevap:

$(y - 2x)(y + 2x) \leq 0$

198.



$2x + y - 8 \leq 0$

$y \geq x$

eşitsizliğini sağlayan noktalar?

Cevap: B bölgesi

199. A(1,2) noktasının B(-6, 4) noktasına göre simetriği C;

- C nin Ox'e göre simetriği D
 D nin orjine göre simetriği E
 E nin F(4, 12) göre simetriği G
 G nin Oy ye göre simetriği H
 H in $x=4$ e göre simetriği I
 I nin $y=-2$ e göre simetriği J
 J nin $y=x$ e göre simetriği K
 K nin A(1,2) ye göre simetriği L
 L nin M(6,3) e göre simetriği N
 N nin Ox e göre simetriği O
 O nun orjine göre simetriği Ö
 Ö nun P(3,5) göre simetriği R
 R nin O ya göre simetriği S
 S nin Ş(1, -2) göre simetriği T
 T nin $x=3$ e göre simetriği U
 U nun $y=6$ ya göre simetriği V
 V nin $y=x$ e göre simetriği Y
 Y nin $y=-x$ e göre simetriği Z=?

Cevap: (-5, 18)

200. A(6,4) noktaarı $x-y-6=0$ doğrusuna göre simetriği B ise $|AB|=?$

Cevap: $4\sqrt{2}$

201. A(3,4) noktasının $3x+4y+a=0$ doğrusuna göre simetriği B ise $|AB|=6$ ise a nın alabileceği değerler toplamı?

Cevap: -50

202. A(1, -1) noktasının $x-y+6=0$ doğrusuna göre simetriği B(x,y)=?

Cevap: (-7, 7)

203. A(4, -6) noktasının $2x+y-2=0$ doğrusuna göre simetriği B nedir?

Cevap: A(4, -6)

204. A(2, 3) noktasının $y=mx+n$ doğrusuna göre simetriği B(-12, 7) ise $m+n=?$

Cevap: 26

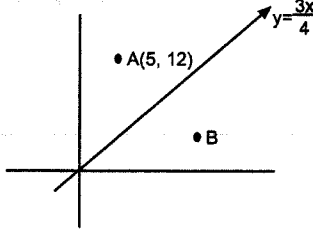
205. A(4, m) noktasının $2x-3y+k=0$ doğrusuna göre simetriği B(m,2) ise $m=?$

Cevap: 8

206. A(6, 3) noktasının $3x-ny+k=0$ doğrusuna göre simetriği B(2, -3) ise $n-k=?$

Cevap: $\frac{15}{2}$

207.



A noktasının
 $y = \frac{3x}{4}$
 göre simetriği B
 ise
 $|AB| = ?$

Cevap: $\frac{66}{5}$

208. $4x - y - 2 = 0$ doğrusunun $A(1, 4)$ noktasına göre simetriği nedir?

Cevap: $4x - y + 2 = 0$

209. $3x - 2y + 6 = 0$ doğrusunun $A(-4, 2)$ ye göre simetriği nedir?

Cevap: $3x - 2y + 26 = 0$

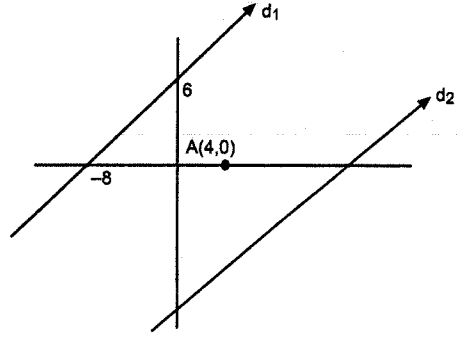
210. $3x - 6y + 4 = 0$ doğrusunun $A(k, 2)$ noktasına göre simetriği $ax + 6y + 12 = 0$ ise $a + k = ?$

Cevap: $\frac{7}{3}$

211. $4x - 3y + 10 = 0$ doğrusunun orijen göre simetriği nedir?

Cevap: $4x - 3y - 10 = 0$

212.



d_1 doğrusunun A ya göre simetriği d_2 ise $d_2 = ?$

Cevap: $3x - 4y - 48 = 0$

213. $3x + 6y - 24 = 0$ doğrusunun $A(k, -2)$ ye göre simetriği $B(-3, 4)$ noktasından geçtiğine göre $k = ?$

Cevap: $\frac{21}{2}$

214. $4x - y + 6 = 0$ doğrusunun
 $4x - y - 2 = 0$ doğrusuna göre simetriği?

Cevap: $4x - y - 10 = 0$

215. $2x - 3y + 6 = 0$ doğrusunun
 $2x - 3y + 1 = 0$ doğrusuna göre simetriği?

Cevap: $2x - 3y - 4 = 0$

216. $2x - y + 12 = 0$ doğrusunun $2x - y + k$ doğrusuna göre simetriği $A(4, 2)$ noktasından geçtiğine göre $k = ?$

Cevap: 3

217. $4x+3y-12=0$ doğrusunun Ox e göre simetriği?

Cevap: $4x-3y-12=0$

218. $-4x+3y-48=0$ doğrusunun Oy ye göre simetriği?

Cevap: $4x+3y-48=0$

219. $2y-3x+6=0$ doğrusunun $y=x$ e göre simetriği?

Cevap: $2x-3y+6=0$

220. $4x-y+16=0$ doğrusunun $y=-x$ e göre simetriği?

Cevap: $x-4y+16=0$

221. $4x-y+k=0$ doğrusunun $y=x$ e göre simetriği $A(4,1)$ noktasından geçtiğine göre $k=?$

Cevap: 0

222. $2x-y+m=0$ doğrusunun $y=-x$ e göre simetriği $A(4,6)$ noktasından geçtiğine göre $m=?$

Cevap: 8

223. $2x+3y-12=0$ nin $x=2$ ye göre simetriği?

Cevap: $2x-3y+4=0$

224. $4x+3y-12=0$ doğrusunun $y=6$ ya göre simetriği?

Cevap: $4x-3y+24=0$

225. $4x-5y+20=0$ doğrusunun $y=-2$ ye göre simetriği?

Cevap: $4x+5y+40=0$

226. $4x+5y-20=0$ doğrusunun $x=6$ ya göre simetriği?

Cevap: $4x-5y-28=0$

227. $d_1: 4x+3y-24=0$ doğrusunun $y=2$ ye göre simetriği d_2 dir.
 d_1, d_2 ve Oy doğruları arasında kalan bölgenin alanı?

Cevap: 27

228. $y+2x-6=0$ doğrusunun
 $y-x+1=0$ doğrusuna göre simetriği?

Cevap: $x+2y-5=0$

229. $2y-x-4=0$ doğrusunun
 $x+y-2=0$ doğrusuna göre simetriği?

Cevap: $2x-y+2=0$

230. $4x-3y-2=0$ doğrusunun
 $y-x-2=0$ doğrusuna göre simetriği nedir?

Cevap: $3x-4y+16=0$

231. $2x+3y+6=0$ doğrusunun
 $y+x+6=0$ doğrusuna göre simetriği?

Cevap: $3x+2y+24=0$

232. $A(-2, 6)$ ve $B(10, 4)$ noktalarına eşit uzaklıktaki noktaların geometrik yer denklemini bulunuz?

Cevap: $y=6x-19$

233. $A(6,2)$, $B(4,-12)$ noktaları için $|AB|$ nin orta dikmesi nedir?

Cevap: $7y+x+30=0$

234. $A(1,2)$ noktasının $x-y+4=0$ doğrusuna en yakın noktasını bulunuz?

Cevap: $\left(-\frac{1}{2}, \frac{7}{2}\right)$

235. $A(4,a)$ noktasının $2x+y+k=0$ doğrusuna en yakın noktası $B(-2, 2)$ ise $a+k=?$

Cevap: 7

236. Orijinin $4x+3y+48=0$ doğrusuna en yakın noktasını bulunuz?

Cevap: $\left(-\frac{192}{25}, -\frac{144}{25}\right)$

237. A(4,8) B(8,2) ve C(x,0) noktaları veriliyor.
|AC| + |BC| nin en küçük olması için x=?

Cevap: $\frac{36}{5}$

238. A(-2,12), B(-8,6) ve C(0,y) noktaları veriliyor.
|AC| + |BC| nin en küçük olması için y=?

Cevap: $\frac{54}{5}$

239. A(6,2) B(8,-4) ve C(x,0) noktaları veriliyor.
|AC| + |BC| nin en küçük olması için x=?

Cevap: $\frac{20}{3}$

240. A(12,4), B(8,1) ve C(x,0) noktaları veriliyor.
|AC| - |BC| nin en büyük olması için x=?

Cevap: $\frac{20}{3}$

241. A(-2,12), B(-6,4) ve C(x,0) için
|AC| - |BC| nin en büyük olması için x=?

Cevap: -8

242. A(6,2), B(4,6) ve C(0,y) için
|AC| - |BC| nin en büyük olması için y=?

Cevap: 14

243. $x^2 + y^2 - 2xy - 16 = 0$
doğruları arasındaki uzaklık kaç br dir?

Cevap: $4\sqrt{2}$

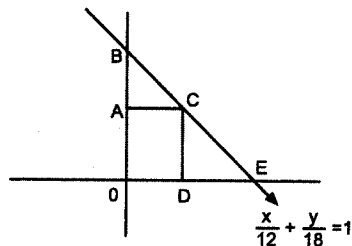
244. $x^2 + 2x - y^2 + 6y - 8 = 0$
doğrularının kesim noktası?

Cevap: (-1, 3)

245. $f(x) = 2x + 6$ ise
 $2[f(x) + f^{-1}(x)]$ in grafiği?

Cevap: $y = 5x + 6$ 'nın grafiği

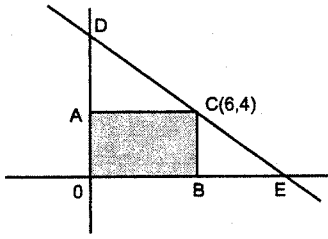
246



AODC
dikdörtgeni-
nin alanın en
büyük değe-
ri?

Cevap: 54

247.



AOBC dik-
dörtgeninin
en büyük ala-
nı aldığı du-
rumda [DE]
doğrusunun
denklemini?

Cevap: $2x+3y-24=0$

248. A(1,2) ve B(m,4) noktaları $2x-y+6=0$ doğrusunun farklı taraflarında ise m in en büyük tamsayı de-
ğeri kaçtır?

Cevap: -2

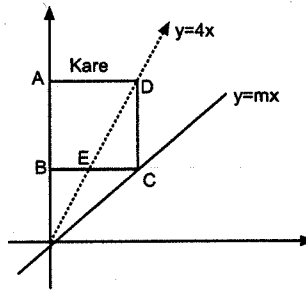
249. A(-2, 12) ve B(4, m) noktaları $3x-4y+12=0$ doğ-
rusunun farklı bölgelerinde ise m in en büyük
değeri kaçtır?

Cevap: 5

250. $3x-4y+24=0$ doğrusu üzerinde olup apsisi ordi-
natına eşit olan noktayı bulunuz?

Cevap: (24, 24)

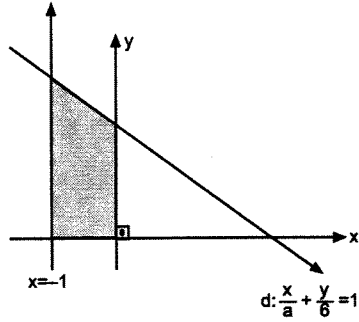
251.



m = ?

Cevap: 3

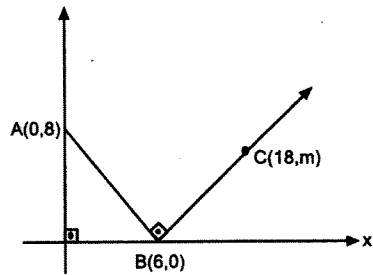
252.



T . A = 10
ise
a = ?

Cevap: $\frac{3}{4}$

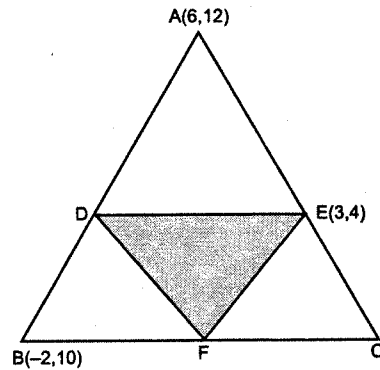
253.



m = ?

Cevap: 9

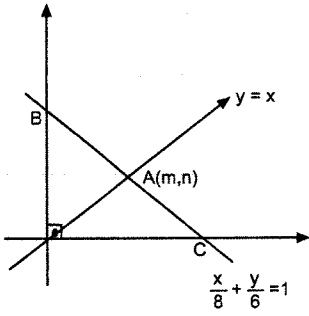
254.



D, E, F or-
ta nokta-
ları ise
T . A = ?

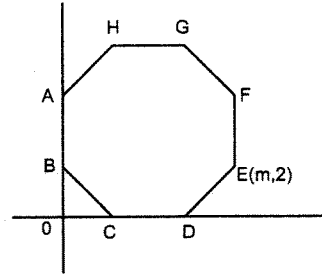
Cevap: $\frac{29}{2}$

255.

 $(m, n) = ?$

Cevap: $\left(\frac{24}{7}, \frac{24}{7}\right)$

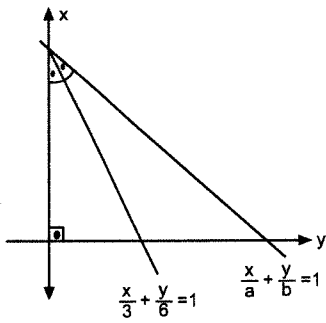
258.



Düzgün
sekizgen
 $m = ?$

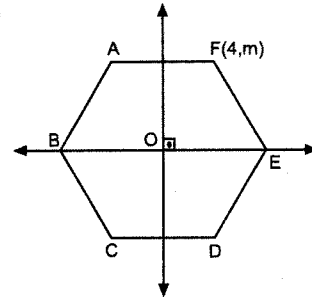
Cevap: $4+2\sqrt{2}$

256.

 $a+b = ?$

Cevap: 14

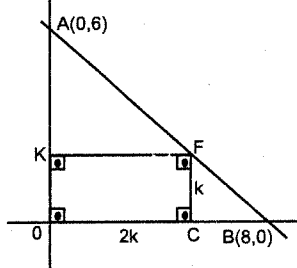
258.



O, düzgün
altıgenin ağırlık
merkezi
 $m = ?$

Cevap: $4\sqrt{3}$

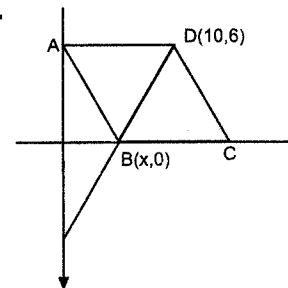
257.



Alan(KOCF) = ?

Cevap: $\frac{288}{25}$

259.



ABCD Eşkenar
dörtgen
 $x = ?$

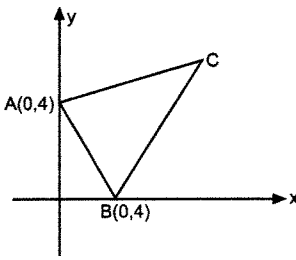
Cevap: 8

261. $4x-3y-12=0$
 $3x+4y+10=0$

doğrularına eşit uzaklıkta bulunan noktaların geometrik yerlerini bulunuz?

Cevap: $x-7y-22=0$
 $7x+y-2=0$

262.



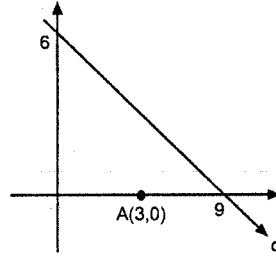
Alan($\widehat{ABC}$)
sabit kalmak
şartıyla C nokta-
larının geometrik
yeri ne olabilir?

Cevap: $x+y+m=0$

263. $y=mx+6$ doğrusu Ox i A da Oy yi B de kesiyor.
C de Ox eksenini üzerinde ve Alan($\widehat{ABC}$)=24 ise
C(x,o) noktalarının apsisleri farkı kaçtır?

Cevap: 16

264.



A noktasının d
doğrusu üzerindeki
en yakın noktasına
olan uzaklığı kaç br
dir?

Cevap: $\frac{12}{\sqrt{13}}$

265. $|x| + |y| \leq 3$

eşitsizliğini sağlayan A(x, y) tamsayı ikilileri
kaç tanedir?

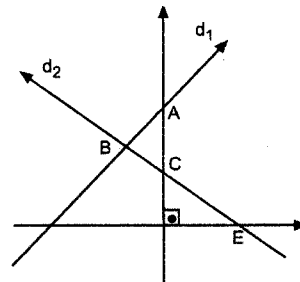
Cevap: 25

266. $|x+y| \leq 4$

eşitsizliğini sağlayan ve eksenler üzerinde
olan koordinatları tamsayı olan kaç nokta var-
dır?

Cevap: 17

267.

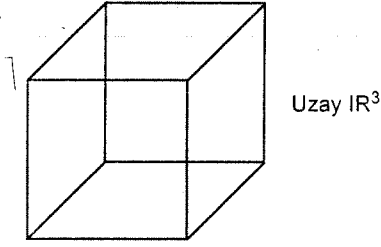


ABC eşkenar

$m_1+m_2=?$

Cevap: 0

UZAY GEOMETRİ

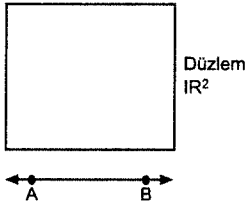


Nokta: Boyutsuzdur.

Doğru: Bir boyutludur.

Düzlem: İki boyutlu (IR^2) Alan belirtir.

Uzay: Üç boyutludur (IR^3) Hacim belirtir.



IR^2 de

- I. İki doğru birbirine paralel olabilir.
- II. İki doğru kesişebilir.
- III. Çakışık olabilir.

IR^3 te

- İki doğru paralel olabilir.
- İki doğru kesişebilir.
- Birbiriyle kesişmeyen ve paralel olmayan iki doğru aykırı doğrular olabilirler.

Düzlem Belirtme Şartları

- Doğrusal olmayan üç nokta bir düzlem belirtir.
- Bir doğru ile dışındaki bir nokta bir düzlem belirtir.
- Kesişen iki doğru bir düzlem belirtir.
- Paralel iki doğru bir düzlem belirtir.

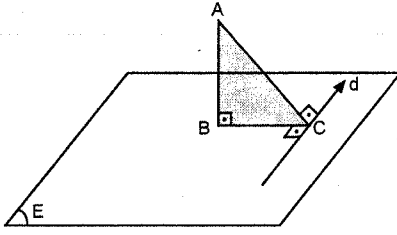
Doğru ile Düzlem arasındaki ilişki

- Doğru ile düzlemin ortak iki noktası varsa, doğru düzlem içindedir.
- Doğru ile düzlemin ortak bir noktası varsa doğru düzlemi keser.
- Doğru ile düzlemin ortak noktaları yoksa doğru düzleme paraleldir.
- Uzayda veya düzlemde bir doğruya dışındaki bir noktadan ancak bir paralel doğru çizilebilir.
- Uzayda veya düzlemde aynı doğruya paralel olan doğrular birbirine paraleldir.
- Uzayda paralel iki doğrudan birini kesen doğru diğerini kesmeyebilir. Düzlemde paralel iki doğrudan birini kesen doğru diğerini keser.
- Uzayda bir doğruya üzerindeki bir noktadan sonsuz tane, düzlemde ise bir doğruya üzerindeki bir noktadan bir tane dik doğru çizilir.
- Uzayda paralel iki doğrudan birine dik olan bir doğru diğerine ya diktir ya da dik durumludur.
- Bir doğrudan sonsuz tane düzlem geçer.
- Bir doğru bir düzleme dik ise, doğrunun düzlemde dik olduğu noktadan geçen düzlem içindeki her doğruya diktir.
- Aykırı doğrular vardır fakat aykırı düzlem diye bir şey yoktur.
- R^2 de farklı iki noktaya eşit uzaklıktaki noktalar kümesine kenar orta dikme denir.
- R^3 te farklı iki noktaya eşit uzaklıktaki noktalar kümesine orta dikme düzlemi denir.

Uzay Belirtme Şartları

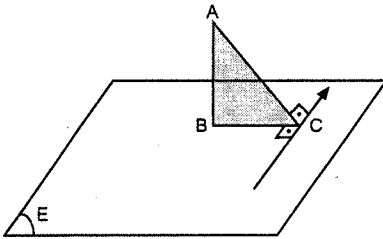
- Paralel iki düzlem
- Kesişen iki düzlem
- Bir düzlem ve dışındaki bir nokta
- Aynı düzlem içinde olmayan dört nokta UZAY belirtir.

ÜÇ DİKME TEOREMİ



Şekilde E düzlemi ve düzlem içindeki d doğrusuna A noktasından indirilen dikmeler Düzlemi B, doğruyu C noktasında kesmektedir. Bu durumda: $[AC] \perp d$, $[AB] \perp (E)$ ise $[BC] \perp d$ olur. Bu üç dikmenin herhangi ikisi verilirse diğeri de gönül rahatlığı ile dik yazılır.

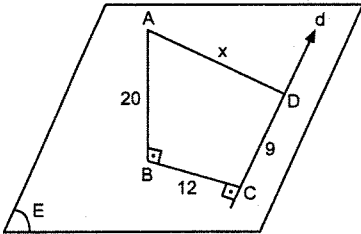
Örnek:



$$\begin{aligned} |AC| &= 12 \\ |AB| &= 6 \\ |BC| &= ? \end{aligned}$$

Cevap: $6\sqrt{3}$

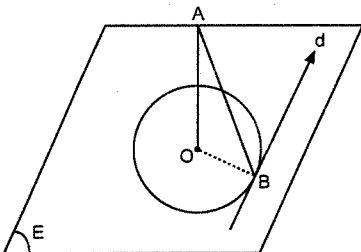
Örnek:



$$\begin{aligned} |AB| &= 20 \text{ cm} \\ |BC| &= 12 \text{ cm} \\ |DC| &= 9 \text{ cm ise} \\ |AD| &= x \text{ kaçtır?} \end{aligned}$$

Cevap: 25

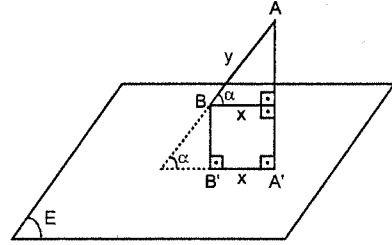
Örnek:



$$\begin{aligned} B \text{ noktası teğetin} \\ \text{değme noktası} \\ \text{çemberin yarıçapı} \\ 5 \\ |AO| &= 12 \text{ cm ise} \\ |AB| &= ? \end{aligned}$$

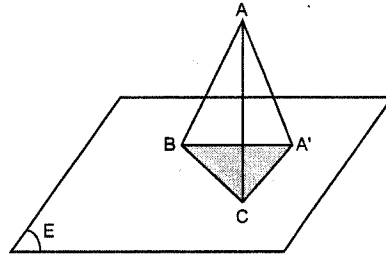
Cevap: 13

Bir doğrunun bir düzlemdeki izdüşümü ile yaptığı dar açıya doğru ile düzlem arasındaki açı denir.



$|AB|$ 'nin dik izdüşümü $|A'B'|$ dur. $|AB|$ ile E düzlemi arasındaki açı α dır.

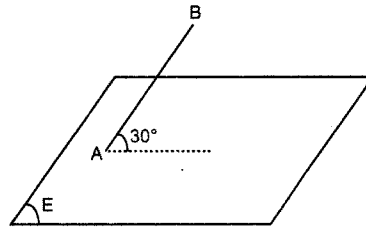
$$\cos \alpha = \frac{x}{y} \Rightarrow |AB| \cdot \cos \alpha = |A'B'|$$



ABC üçgeninin E düzlemi üzerindeki dik izdüşümü $A'B'C'$ üçgenidir.

$$\text{Alan}(\widehat{ABC}) \cdot \cos \alpha = \text{Alan}(\widehat{A'B'C'}) \text{ dir.}$$

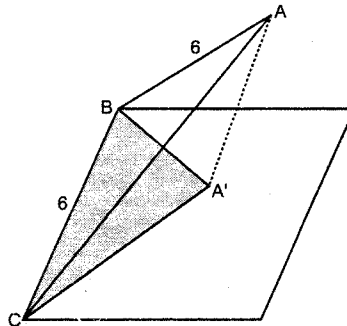
Örnek:



$|AB| = 12 \text{ cm}$ ise $|AB|$ 'nin E düzlemi üzerindeki dik izdüşümü kaç cm dir?

Cevap: $6\sqrt{3}$

Örnek:



ABC eşkenar üçgenin dik izdüşümü $A'B'C'$ üçgenidir.

$|AA'| = \sqrt{11} \text{ cm}$ ise $\text{Alan}(\widehat{A'B'C'})$ kaç cm^2 dir?

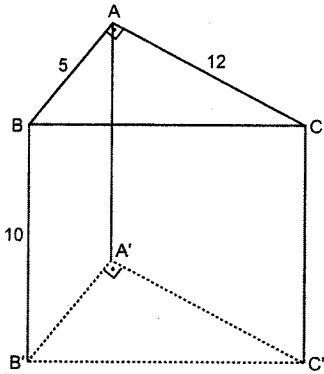
Cevap: 12

PRİZMA

Dik Prizma:

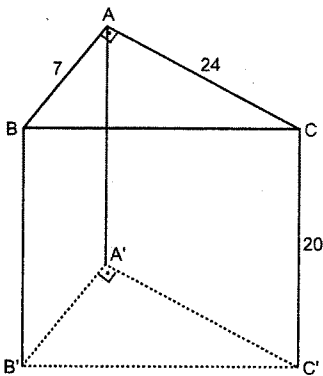
Yanal ayrıtları taban düzlemine dik olan prizmaya dik prizma denir.

- Tabanı üçgen olan dik Prizma, üçgen dik Prizma diye okunur.
- Tabanı kare olan dik Prizma kare dik Prizma diye okunur.
- Tabanı düzgün altıgen olan dik Prizma Düzgün altıgen dik Prizma diye okunur.
- Taban çevresi çarpı yükseklik Yanal Alandır.
- Bütün Prizmaların hacimleri taban alanı çarpı yüksekliktir.
- Y.A = Yanal Alan demektir.



Hacim = ?
Y. Alan = ?
Bütan Alan = ?

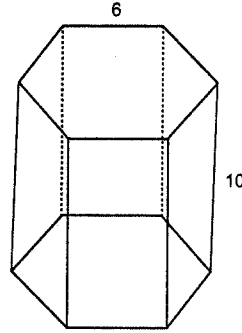
Cevap: V = 300
Y.A = 300
Alan = 360



a) Bütan Alan = ?
b) V = ?

Cevap: a) Alan = 1288
b) V = 1680

Örnek:

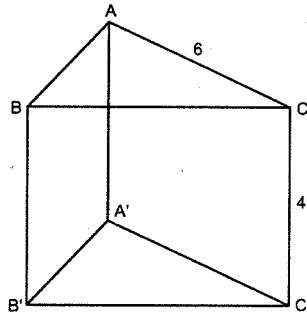


Düzgün Altıgen Dik Prizma

- a) Yanal Alan = ?
b) Bütan Alan = ?
c) Hacim = ?

Cevap: a) 360
b) $360 + 108\sqrt{3}$
c) $540\sqrt{3}$

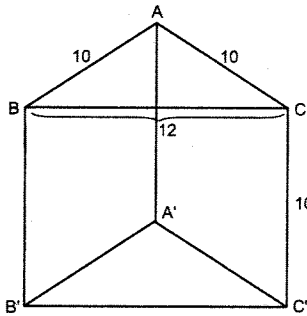
Örnek:



ABC eşkenar üçgen
Üçgen dik Prizma
V = ?

Cevap: $36\sqrt{3}$

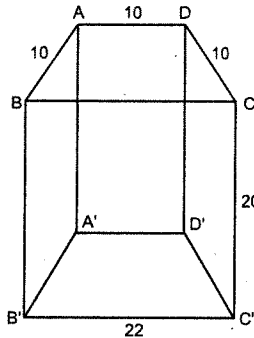
Örnek:



V = ?
Y.A = ?
Tüm Alan = ?

Cevap: a) V = 480
b) Y.A = 320
c) Tüm Alan: 416

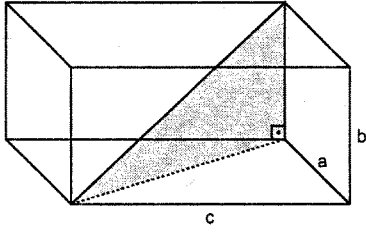
Örnek:



V = ?

Cevap: 2560

DİKDÖRTGENLER PRİZMASI



a, b, c ayrıtlar olmak üzere;

$$V = \text{Hacim} = a.b.c$$

$$\text{Alan} = 2ab + 2bc + 2ac$$

- Yüzey köşegenleri farklı dikdörtgenlerin köşegen uzunluklarıdır.
- Cisim köşegeni $\sqrt{a^2 + b^2 + c^2}$

$$(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ac$$

$$\Rightarrow (a + b + c)^2 = (\text{cisim köşegeninin karesi}) + \text{Alan}$$

Örnek:

Bir dikdörtgenler prizmasının ayrıtları 2, 3 ve 5 sayıları ile orantılıdır. Hacmi 810 cm^3 ise Alanı kaç cm^2 dir?

Cevap: 558

Örnek:

Ayrıtları 5, 10, 15 cm olan bir dikdörtgenler prizmasının cisim köşegeni kaç cm dir?

Cevap: $5\sqrt{14}$

Örnek:

Alanı 400 cm^2 ve cisim köşegeninin uzunluğu 15 cm olan dikdörtgenler prizmasının ayrıtları toplamı kaç cm dir?

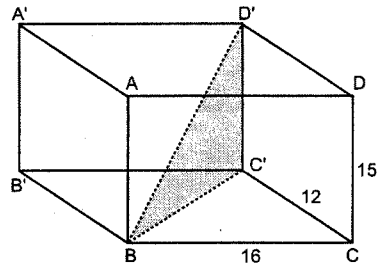
Cevap: 25

Örnek:

Bir dikdörtgenler prizmasının farklı yüzeylerinin alanları sırasıyla 12, 18, 24 cm^2 ise prizmanın hacmi kaç cm^3 tür?

Cevap: 72

Örnek:



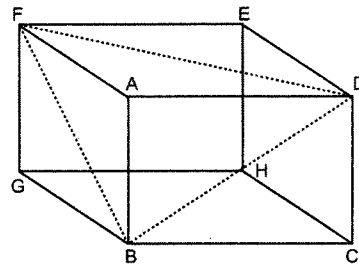
A) Alan ($\widehat{BC'D'}$) = ?

B) $\angle(\widehat{BC'D'})$ = ?

Cevap: A → 150

B → 60

Örnek:



$|FB| = 8 \text{ cm}$

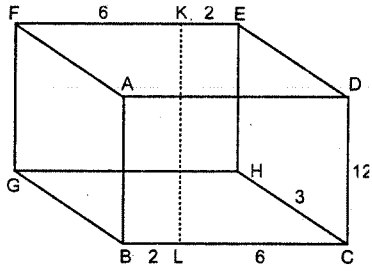
$|BD| = 5 \text{ cm}$

$|FD| = 7 \text{ cm}$ ise

cisim köşegeninin uzunluğu kaç cm dir?

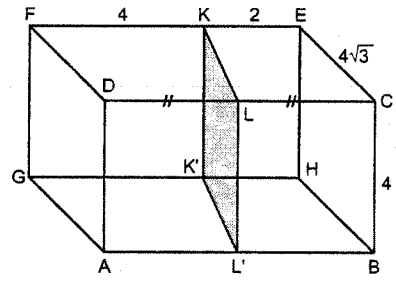
Cevap: $\sqrt{69}$

Örnek:



Cevap: 13

Örnek:

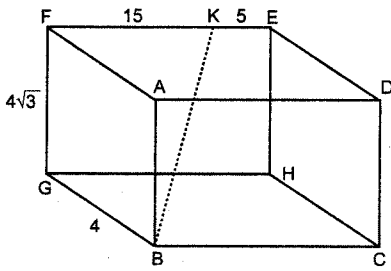


$$|KE| = |K'H|$$

KLL'K' dikdörtgeninin alanı kaç cm^2 dir?

Cevap: 28

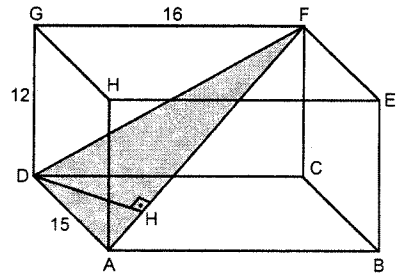
Örnek:



$$|BK| = ?$$

Cevap: 17

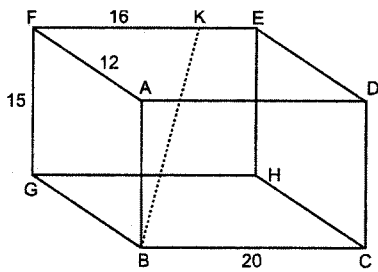
Örnek:



$$|DH| = ?$$

Cevap: 12

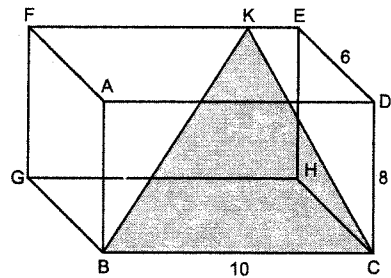
Örnek:



$$|BK| = ?$$

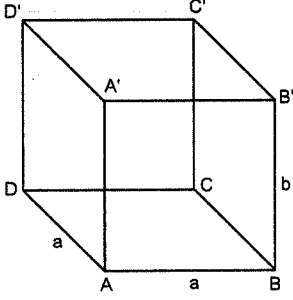
Cevap: 25

Örnek:

Taralı Alan kaç cm^2 dir?

Cevap: 50

KARE DİK PRİZMA



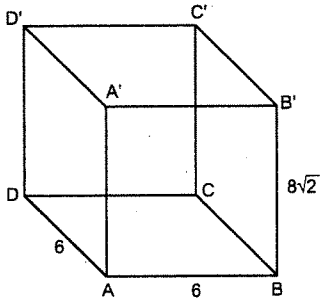
ABCD kare

$$V = a^2 \cdot b$$

$$\text{Alan: } 2 \cdot (a \cdot a + a \cdot b + a \cdot b) = 2(a^2 + 2ab)$$

$$\text{Cisim Köşegeni: } \sqrt{a^2 + a^2 + b^2} = \sqrt{2a^2 + b^2}$$

Örnek:



Cisim Köşegeni = ?

$$V = ?$$

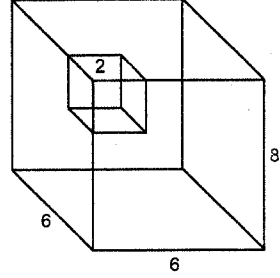
$$\text{Alanı} = ?$$

$$\text{Cevap: C.K} = 10\sqrt{2}$$

$$V = 288\sqrt{2}$$

$$\text{Alanı} = 19\sqrt{2} + 72$$

Örnek:



Kare dik Prizma şeklindeki bir cisimden bir ayrıtı 2 cm olacak şekilde bir küp çıkartılıyor.

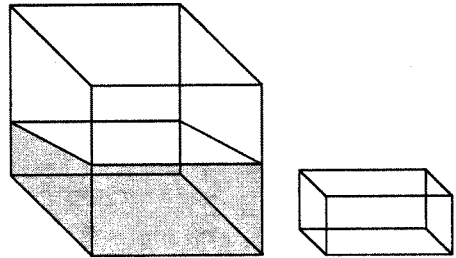
a) Yeni Şeklin Alanı?

b) Yeni Şeklin Hacmi?

Cevap: Alanı Değişmez (264)

Hacmi: 280

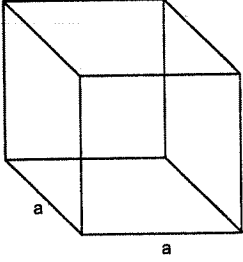
Örnek:



Bir ayrıtının uzunluğu 6 cm ve yüksekliğinin yarısına kadar su dolu bir kübün içine ayrıtları 2,2, 3 cm olacak şekilde bir kare-dik prizma atılıyor. Suyun yüksekliği kaç cm olur?

$$\text{Cevap: } \frac{10}{3}$$

KÜP



$$V = a^3$$

$$\text{Alan} = 6a^2$$

$$\text{Yüzey köşegeni} = a\sqrt{2}$$

$$\text{Cisim köşegeni} = a\sqrt{3}$$

Örnek:

Bir ayrıtının uzunluğu 4 cm olan küpün hacmini, alanı ve cisim köşegenini bulunuz?

$$\text{Cevap: } V = 64$$

$$\text{Alan} = 96$$

$$\text{C.k} = 4\sqrt{3}$$

Örnek:

Alanı sayıca hacmine oranı $\frac{2}{3}$ olan bir kübün yüzey köşegeni?

$$\text{Cevap: } 9\sqrt{2}$$

Örnek:

Bir kübün ayrıtlarını 3 cm artırdığımızda hacmi 216 cm^3 oluyor, ayrıtlarını 1 cm küçültüğümüzde hacmi kaç cm^3 olur?

$$\text{Cevap: } 8$$

Örnek:

Ayrıtları 2, 4 ve 8 cm olan bir dikdörtgenler prizmasının hacmine eşit olan bir kübün alanı kaç cm^2 dir?

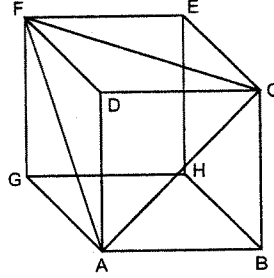
$$\text{Cevap: } 96$$

Örnek:

Bir kübün hacminden-alanını çıkardığımızda bir ayrıtının 7 katı çıkıyor.

Bu kübün cisim köşegeni kaçtır?

$$\text{Cevap: } 7\sqrt{3}$$

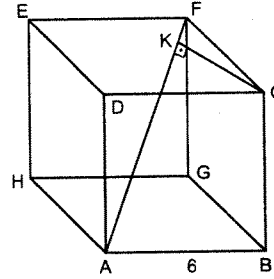


Örnek:

Küp

$$\text{Alan}(\triangle AFC) = ?$$

$$\text{Cevap: } 18\sqrt{3}$$

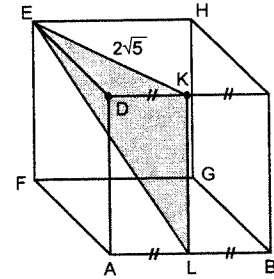


Örnek:

Küp

$$|KC| = ?$$

$$\text{Cevap: } 2\sqrt{6}$$



Örnek:

Küp

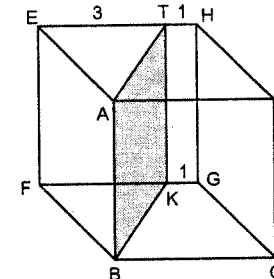
$$|DK| = |KC|$$

$$|AL| = |LB|$$

$$|EK| = 2\sqrt{5}$$

$$|EL| = ?$$

$$\text{Cevap: } 6$$



Örnek:

Küp

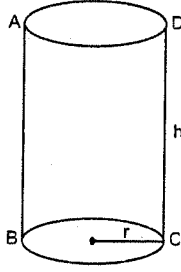
$$|TH| = |KG| = 1 \text{ cm}$$

$$|ET| = 3 \text{ cm ise}$$

$$\text{Alan}(\triangle ABKT) = ?$$

$$\text{Cevap: } 20$$

SİLİNDİR



Tabanı daire olan Prizmaya Silindir denir.

Hacim: Taban Alanı x Yükseklik

$$V = \pi r^2 \cdot h$$

$$\text{Yanal Alan} = 2\pi r \cdot h$$

$$\text{Tüm Alan} = 2\pi r^2 + 2\pi r h$$

Örnek:

Taban yarıçapı 3 cm, yüksekliği 4 cm olan dik silindirin Hacmini bulunuz?

Cevap: 36π

Örnek:

Yanal Alanının hacmine oranı $\frac{1}{3}$ olan silindirin yarıçapı kaçtır?

Cevap: 6

Örnek:

Hacmi 216π , Yanal Alanı 144π olan dik silindirin Tüm Alanı kaç br^2 dir?

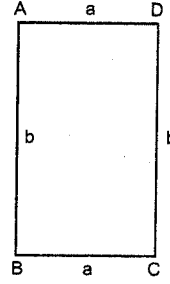
Cevap: 162π

Örnek:

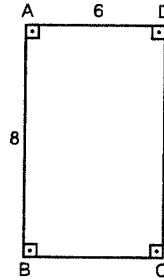
Yüksekliği, taban yarıçapının 3 katı olan bir dik silindirin tüm alanı 128π ise bu silindirin hacmi kaç br^3 tür?

Cevap: 192π

NOT:



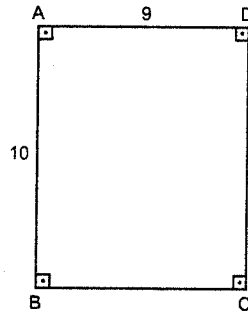
ABCD dikdörtgenini [AB] etrafında 360° döndürsek yarıçapı a, yüksekliği b olan bir dik silindir elde ederiz. 180° döndürsek yarım silindir, 90° döndürsek silindirin dörtte birini elde ederiz.



Örnek:

Yandaki dikdörtgeni [AB] etrafında 360° döndürsek elde edilen cismin hacmi kaç cm^3 olur?

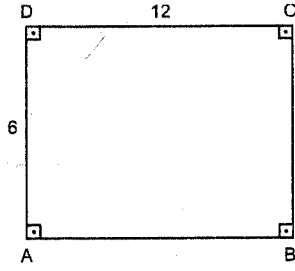
Cevap: 288π



Örnek:

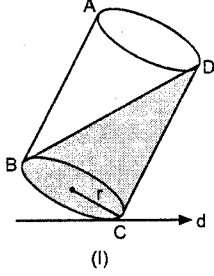
Yandaki dikdörtgeni [AB] etrafında 360° döndürsek elde edilen cismin hacmi kaç cm^3 olur?

Cevap: 810π

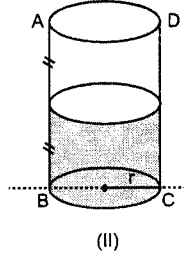


Örnek:

Yandaki dikdörtgeni [AB] etrafında 180° döndürürsek elde edilen cismin hacmi kaç cm^3 olur?

Cevap: 432π 

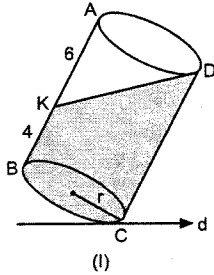
(I)



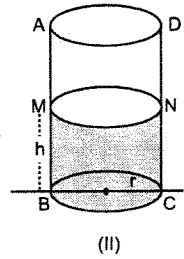
(II)

Şekilde I deki gibi silindirin içindeki suyu dipteki B köşesini görünceye kadar boşaltıp, Şekil II deki gibi düzeltirsek suyun yarısını boşaltmış oluruz.

Örnek:



(I)

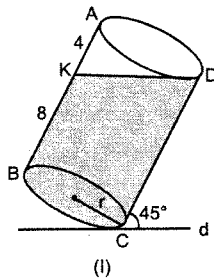


(II)

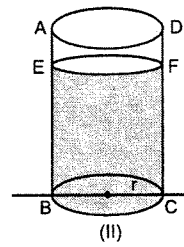
Şekil I, Şekil II ye geldiğinde suyun yüksekliği (h) kaç cm olur?

Cevap: 7

Örnek:



(I)

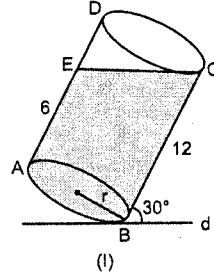


(II)

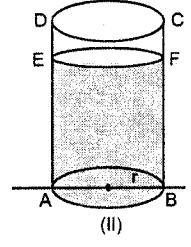
Şekil I, Şekil II ye geldiği zaman silindirdeki suyun hacmi kaç cm^3 olur?

Cevap: 40π

Örnek:



(I)

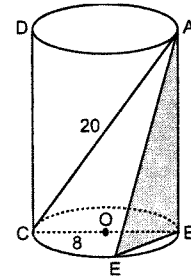


(II)

Şekil I, Şekil II ye getirildiğinde silindirdeki suyun hacmi kaç cm^3 olur?

Cevap: 27π

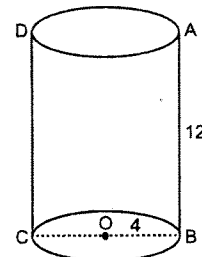
Örnek:



$\widehat{A(ABE)} = ?$
 $|AC| = 20 \text{ cm}$
 $|BE| = 5 \text{ cm}$

Cevap: 30

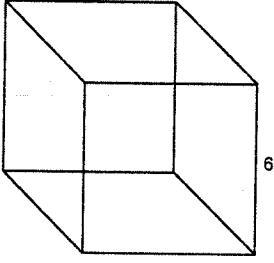
Örnek:



Şekildeki silindirin içine yerleştirilebilecek en büyük kare dik prizmanın hacmi kaç cm^3 tür?

Cevap: 384

Örnek:



Şekildeki bir kenarı 6 cm olan kübün içine en büyük hacimli yarıçapı 1 cm olan en çok kaç silindir yerleştirilebilir?

Cevap: 9

Örnek:

Bir kenarı 4 cm olan küp içerisinde en büyük hacimli bir silindir yerleştiriliyor. Bu silindirin yanal alanı kaç cm^2 dir?

Cevap: 16π

Örnek:

Bir kenarı 6 cm olan düzgün altıgen dik prizmanın içerisinde en büyük hacimli bir silindir yerleştiriliyor.

Bu prizmanın hacmi $216\sqrt{3} \text{ cm}^3$ ise silindirin hacmi kaç cm^3 tür?

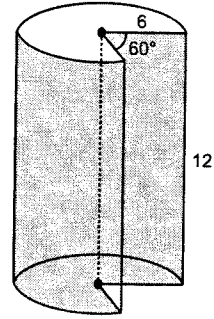
Cevap: 108π

Örnek:

Yarıçapı 4 cm olan bir dik silindirin hacmi $96\pi \text{ cm}^3$ ise bu silindirin içine yerleştirilebilecek en büyük düzgün altıgen dik prizmanın hacmi kaç cm^3 olur?

Cevap: $144\sqrt{3}$

Örnek:



Şekildeki cismin hacmi kaç cm^3 tür?

Cevap: 360π

Örnek:

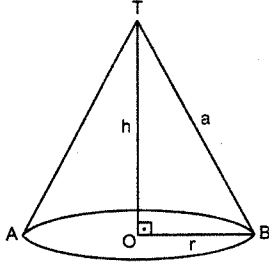
Bir dik silindir biçimindeki cismin tamamı su ile doludur. Suyun 20 cm^3 ü boşaltılırsa su yüksekliği 1,5 cm azalıyor. 50 cm^3 daha boşaltılırsa su yüksekliği silindirin yarısına geliyor.

Silindirin yüksekliği kaç cm dir?

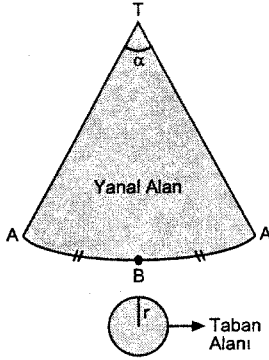
Cevap: $\frac{21}{2}$

KONİ

Tabanı daire olan ve yüksekliği taban merkezi olan cisme dik KONİ denir.



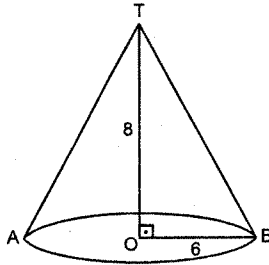
$a \rightarrow$ Ana doğru
 $h \rightarrow$ Yükseklik
 $r \rightarrow$ Taban yarıçapı
 (Dik Koni)



Yanal Alanı = $\pi \cdot r \cdot a$
 Taban Alanı = $\pi \cdot r^2$
 Tüm Alanı : $\pi r^2 + \pi r \cdot a$
 Hacim = $V = \frac{1}{3} \pi r^2 \cdot h$

$$\frac{\alpha}{360} = \frac{r}{a}$$

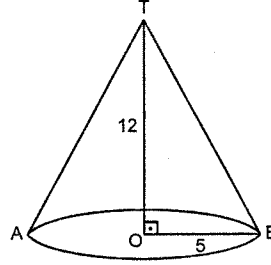
Örnek:



a) Yanal Alanı
 b) Tüm Alanı
 c) Hacmi
 d) Açılımındaki merkez açısı

Cevap: a) 60π
 b) 96π
 c) 96π
 d) 216°

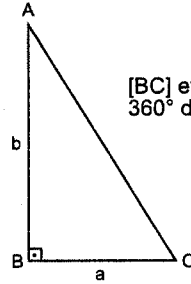
Örnek:



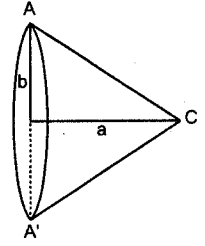
a) Y.A = ?
 b) Tüm Alanı
 c) Hacmi

Cevap: a) 65π
 b) 90π
 c) 100π

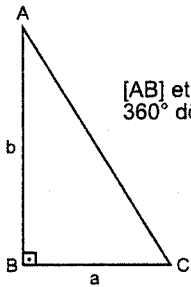
I.



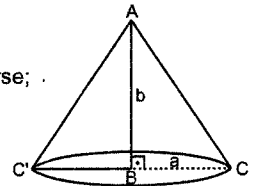
[BC] etrafında 360° döndürülürse;



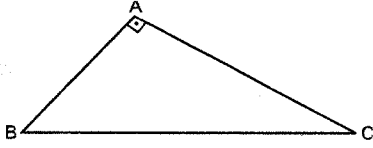
II.



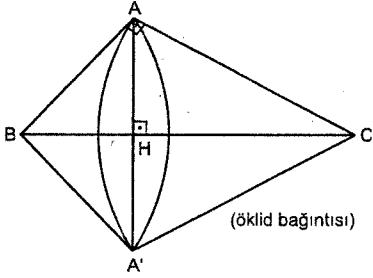
[AB] etrafında 360° döndürülürse;



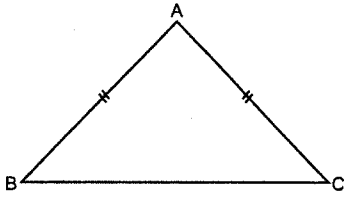
III.



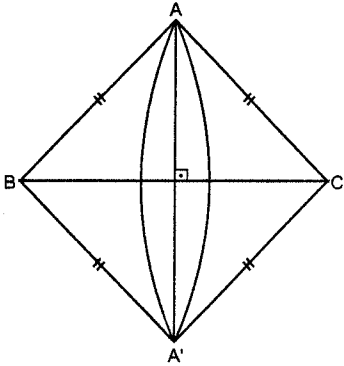
Hipotenüs
etrafında
 360°
döndürülürse,



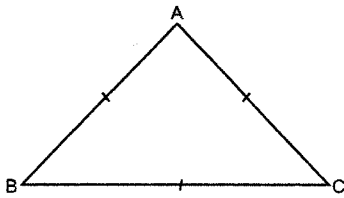
IV.



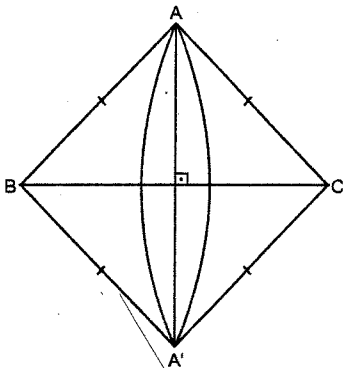
[BC] etrafında
 360°
döndürülürse,



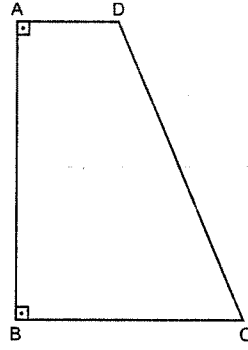
V.



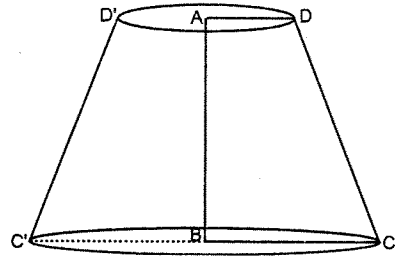
ABC eşkenar üç-
geni herhangi bir
kenarı etrafında
 360° döndürülür-
se;



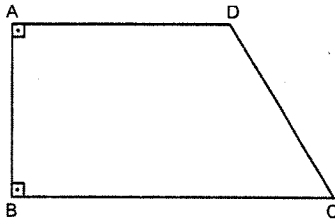
VI.



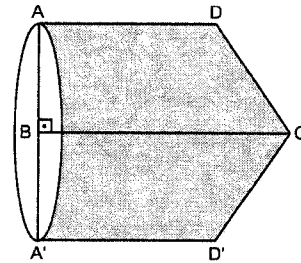
ABC dik yamuğu
[AB] etrafında
 360° döndürülürse;



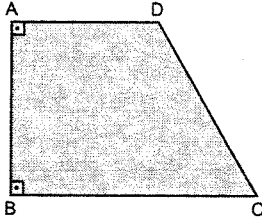
VII.



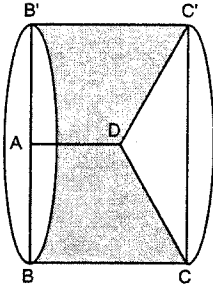
[BC] etrafında
 360° döndü-
rülürse,



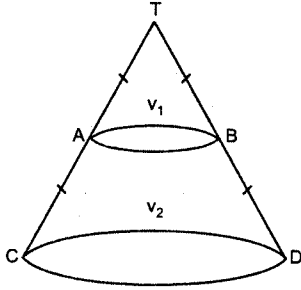
VIII.



[AD] etrafında
360° döndürülürse,

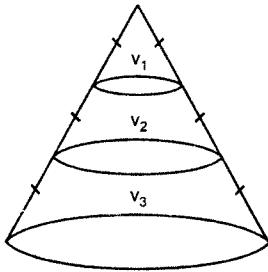


IX.



$$\frac{v_1}{v_1 + v_2} = \left(\frac{1}{2}\right)^3 = \frac{1}{8} \quad v_1 = 1 \quad v_2 = 7$$

*



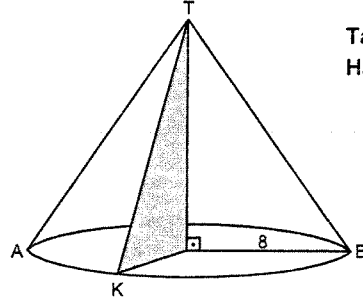
$$v_1 = 1$$

$$v_2 = 7$$

$$v_3 = 19$$

$$\frac{v_1}{v_1 + v_2 + v_3} = \left(\frac{1}{3}\right)^3 = \frac{1}{27}$$

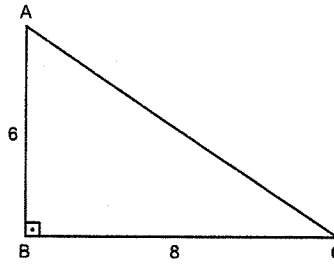
Örnek:



Taralı Alan = 60 cm²
Hacim = ?

Cevap: 320π

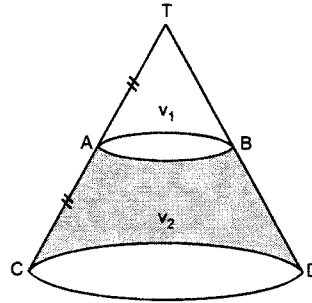
Örnek:



[AB] etrafında
360° döndürülürse
oluşan şeklin hac-
mi kaç cm³ tür?

Cevap: 128π

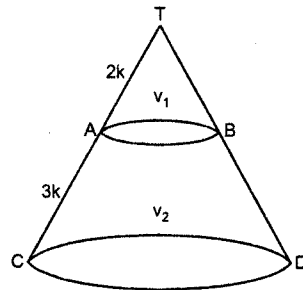
Örnek:



$v_2 = 49\text{cm}^3 \Rightarrow v_1$
kaç cm³ tür?

Cevap: 7

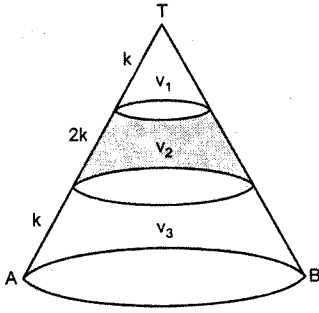
Örnek:



$$\frac{v_1}{v_2} = ?$$

Cevap: $\frac{8}{117}$

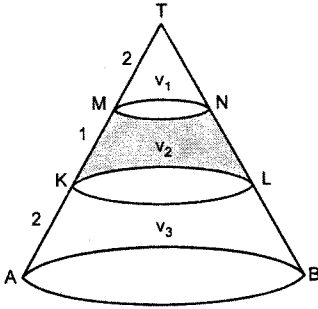
Örnek:



$$\frac{v_3 - v_1}{v_2} = ?$$

Cevap: $\frac{18}{13}$

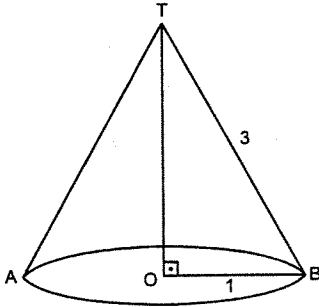
Örnek:



$$\frac{v_1 + v_3}{v_2} = ?$$

Cevap: $\frac{106}{19}$

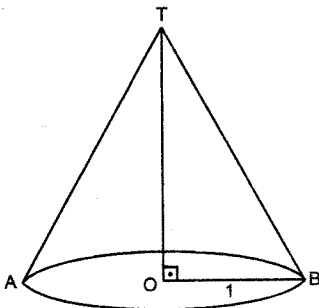
Örnek:



Şekildeki dik koniyi açtığımız zaman oluşacak daire diliminin merkez açısı kaç derece olur?

Cevap: 120°

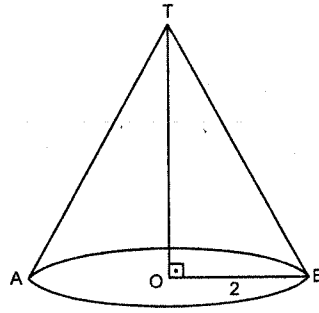
Örnek:



Şekildeki dik koninin yanal alanı 4π ise bu koninin açılımındaki merkez açısı kaç derecedir?

Cevap: 90°

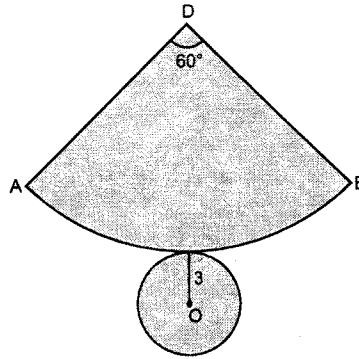
Örnek:



Şekildeki dik koninin hacmi $\frac{4\sqrt{21}\pi}{3}$ cm^3 ise bu koninin açılımındaki merkez açısı kaç derecedir?

Cevap: 144°

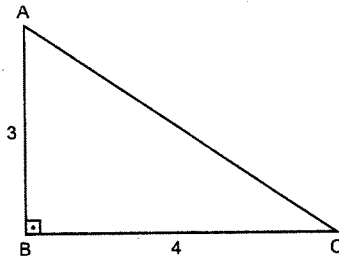
Örnek:



Şekilde görülen bir dik koninin açık şeklidir. Bu koninin yüksekliği kaç cm dir?

Cevap: $3\sqrt{35}$

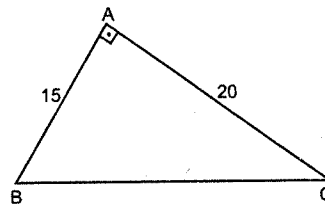
Örnek:



Şekildeki dik üçgenin [AB] etrafında 360° döndürülürse oluşacak yeni şeklin hacmi kaç cm^3 tür?

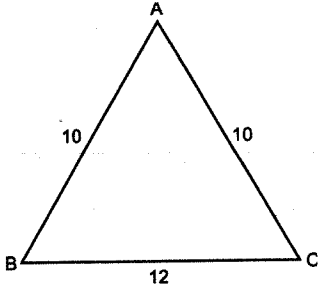
Cevap: 16π

Örnek:



Şekildeki dik üçgeni hipotenüs etrafında 360° döndürürsek oluşacak şeklin hacmi kaç cm^3 tür?

Cevap: 1200π



Örnek:

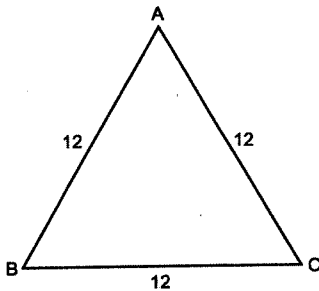
Şekildeki ikizkenar üçgenin [BC] etrafında 360° döndürülmesi ile oluşan yeni şeklin hacmi kaç cm^3 tür?

Cevap: 256π

Örnek:

Yanal Alanı 175π , Tüm Alanı 224π olan bir dik koninin Hacmi kaç cm^3 tür?

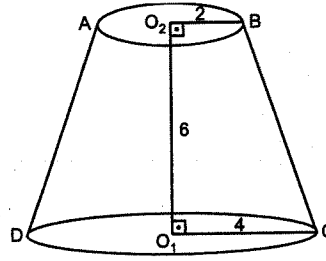
Cevap: 392π



Örnek:

ABC eşkenar üçgenin herhangi bir kenarı etrafında 360° döndürürsek oluşacak yeni şeklin hacmi kaç cm^3 tür?

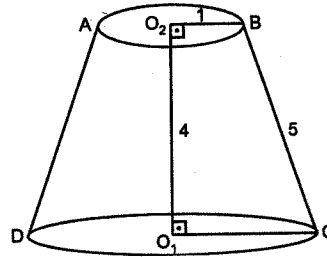
Cevap: 432π



Örnek:

Şekildeki kesik koninin hacmi kaç cm^3 tür?

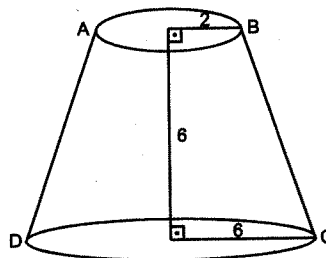
Cevap: 56π



Örnek:

Şekildeki kesik koninin hacmi kaç cm^3 tür?

Cevap: 28π

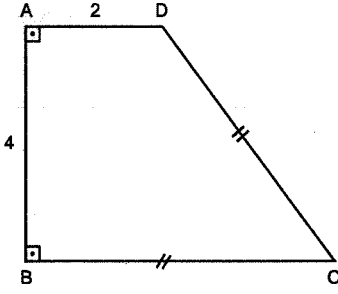


Örnek:

Şekildeki kesik koninin hacmi kaç cm^3 tür?

Cevap: 104π

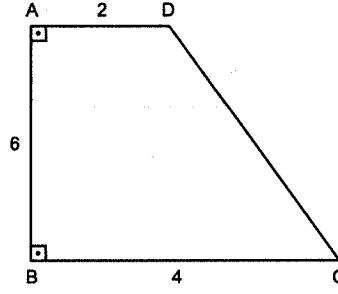
Örnek:



Şekildeki dik yamuğu [AB] etrafında 360° döndürürsek oluşacak cismin hacmi kaç cm^3 olur?

Cevap: 52π

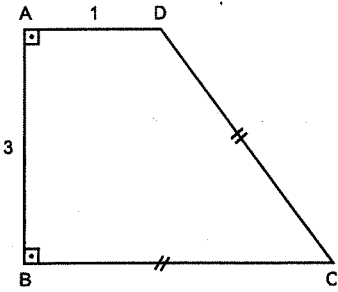
Örnek:



Şekildeki dik yamuğu [BC] etrafında 360° döndürürsek oluşacak şeklin hacmi kaç cm^3 olur?

Cevap: 96π

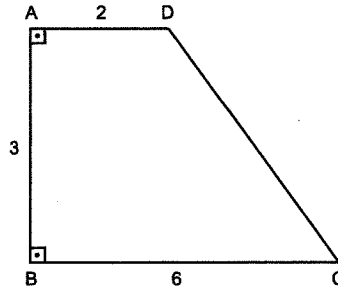
Örnek:



Şekildeki dik yamuğu [AB] etrafında 360° döndürürsek oluşan yeni şeklin hacmi kaç cm^3 olur?

Cevap: 31π

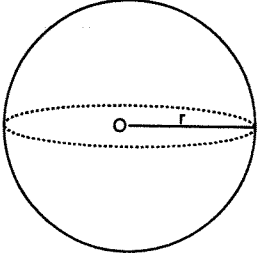
Örnek:



Şekildeki dik yamuğu [AD] etrafında 360° döndürürsek oluşacak yeni şeklin hacmi kaç cm^3 olur?

Cevap: 42π

KÜRE



Kürenin hacmi: $\frac{4}{3}\pi r^3$

Kürenin Alanı: $4\pi r^2$

Küre: Uzayda sabit bir noktaya eşit uzaklıktaki noktalar kümesine denir.

Örnek:

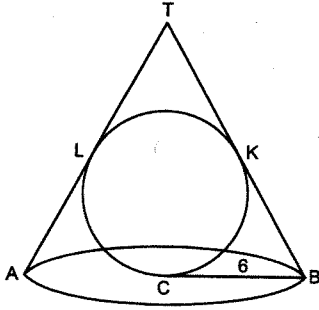
Yarıçapı 3 cm olan kürenin hacmi kaç cm^3 tür?

Cevap: 36π

Örnek:

Yarıçapı 4 cm olan kürenin alanı kaç cm^2 dir?

Cevap: 64π



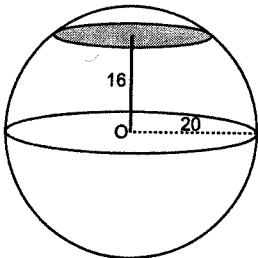
Örnek:

Şekildeki dik koninin içinde en büyük hacimli bir küre yerleştirilmiştir.

$|BC| = 6 \text{ cm}$

$|TB| = 10 \text{ cm}$ ise bu kürenin hacmi kaç cm^3 tür?

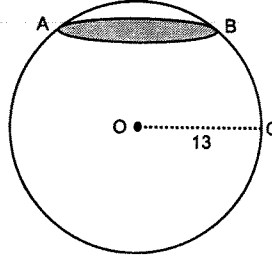
Cevap: 36π



Örnek:

Yarıçapı 20 cm olan kürenin merkezinden 16 cm uzaklıkta bulunan bir düzlemlle kesiliyor. Bu kesitin alanı kaç cm^2 dir?

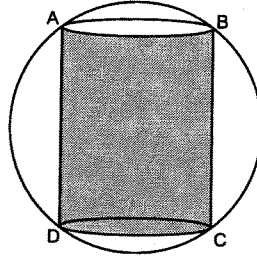
Cevap: 144π



Örnek:

Şekildeki kürenin yarıçapı 13 cm ve $[AB]$ çaplı daire diliminin alanı 25π ise kürenin merkezinin Taralı kesite olan uzaklığı kaç cm dir?

Cevap: 12

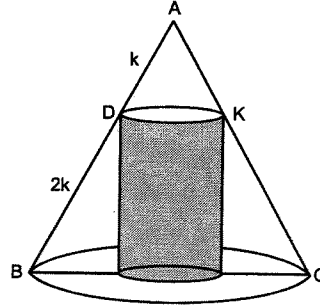


Örnek:

Şekildeki kürenin içine en büyük hacimli bir silindir yerleştirilmiştir.

Kürenin yarıçapı 10 cm silindirin yarıçapı 6 cm ise silindirin hacmi kaç cm^3 tür?

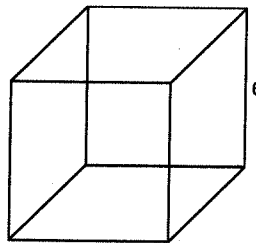
Cevap: 576π



Örnek:

Şekildeki koninin hacminin, içine yerleştirilen silindirin hacmine oranı kaçtır?

Cevap: $\frac{9}{2}$



Örnek:

Şekildeki bir ayrıtı 6 cm olan küpün içine en büyük hacimli silindir yerleştiriliyor. Silindirin hacmi kaç m^3 tür?

Cevap: 54π

Örnek:

Bir ayrıtı 6 cm olan bir küpün içine en büyük hacimli bir koni yerleştiriliyor.

Koninin hacmi kaç cm^3 tür?

Cevap: 18π

Örnek:

Bir ayrıtı 6 cm olan bir küpün içine en büyük hacimli bir küre yerleştiriliyor.

Kürenin hacmi kaç cm^3 tür?

Cevap: 36π

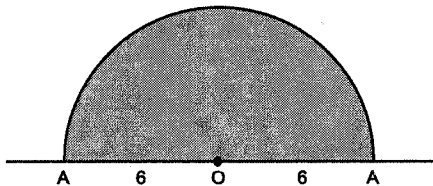
Örnek:

Yarıçapı $3\sqrt{3}$ olan bir kürenin içine en büyük hacimli bir küp yerleştiriliyor.

Küpün hacmi kaç cm^3 tür?

Cevap: 216

Örnek:



Şekildeki yarıçapı 6 cm olan yarım daire [AB] etrafında 360° döndürülürse oluşacak yeni şeklin hacmi kaç cm^3 tür?

Cevap: 288π

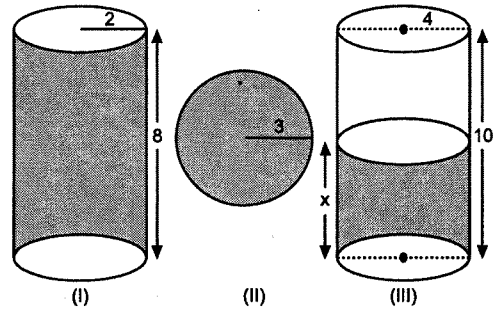
Örnek:

Bir kenarı $2\sqrt{3}$ cm yüksekliği 6 cm olan düzgün altıgen dik prizmanın içine en büyük hacimli bir küre yerleştiriliyor.

Bu kürenin hacmi kaç cm^3 tür?

Cevap: 36π

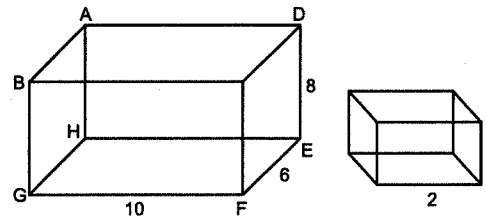
Örnek:



Şekil I ve Şekil II'deki katı cisimler Şekil III'e boşaltılıyor. x uzunluğu kaç cm olur?

Cevap: $\frac{17}{4}$

Örnek:



Şekildeki dikdörtgenler prizmasını içine bir kenarı 2 cm olan küplerden 12 tane eritilerek boş olan prizmaya konuluyor.

Prizmada biriken maddenin yüksekliği kaç cm olur?

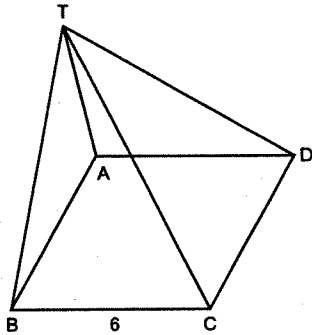
Cevap: $\frac{8}{5}$

PİRAMİT

Düzgün Piramit:

Tabanı düzgün çokgen ve yüksekliği tabanın ağırlık merkezinden geçen piramite denir.

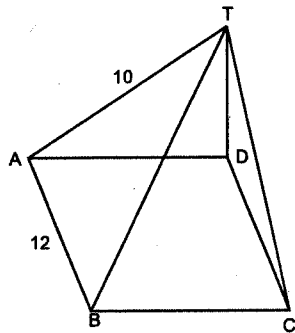
- a) Yan yüzeyleri birbirine eş ikizkenar üçgendir.
- b) Yan ayrıtların uzunlukları eşittir.
- c) Yanal Alan = $\frac{\text{Taban çevresi} \times \text{Yanal yükseklik}}{2}$
- d) Hacim = $\frac{\text{Taban alanı} \times \text{Yükseklik}}{3}$



Örnek:

Yüksekliği 6 cm olan düzgün kare piramidin hacmi kaç cm^3 tür?

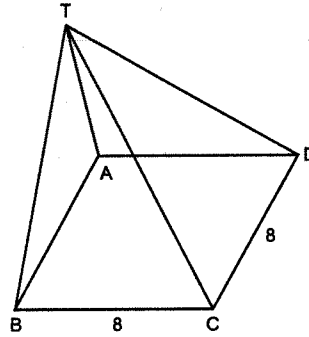
Cevap: 72



Örnek:

Şekildeki düzgün kare piramidinin hacmi kaç cm^3 tür?

Cevap: $96\sqrt{7}$



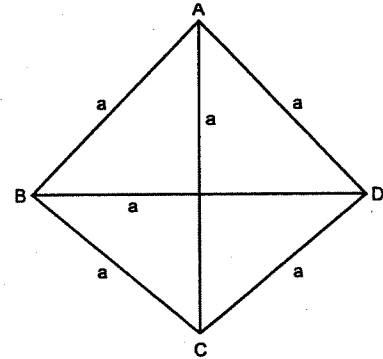
Örnek:

Yanal Alanı 80 cm^2 ise hacmi kaç cm^3 tür?

Cevap: 64 cm^3

Düzgün Dörtüzlü:

Tüm yüzeyleri birer eşkenar üçgen olan piramite denir.



$$\text{Alanı} = 4 \text{ eşkenar üçgenin alanı} = \frac{a^2\sqrt{3}}{4} \cdot 4 = a^2\sqrt{3}$$

$$\text{Hacim} = \frac{a^3\sqrt{2}}{12} \text{ dir.} = \frac{\text{Taban Alanı} \times \text{yükseklik}}{3}$$

$$\text{Yükseklik} = \frac{a\sqrt{6}}{3}$$

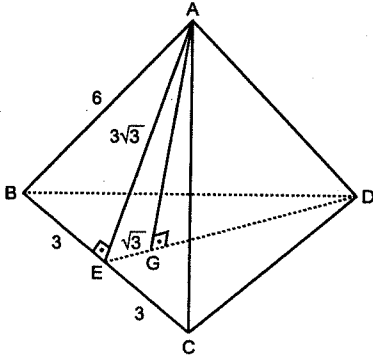
$$\frac{\frac{a^2\sqrt{3}}{4} \cdot \frac{a\sqrt{6}}{3}}{3} = \frac{a^3\sqrt{2}}{12} = V$$

Örnek:

Bir kenarı 6 cm olan düzgün dörtyüzlünün hacmi kaç cm^3 tür?

Cevap: $18\sqrt{2}$

Çözüm:



G:BCD nin ağırlık merkezi

$$|AE|^2 + 3^2 = 6^2$$

$$|AE| = 3\sqrt{3}$$

$[DE] \perp [BC]$ olur. (Üç dikme Teoremi)

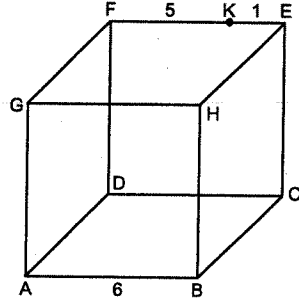
$$|AG|^2 + (\sqrt{3})^2 = (3\sqrt{3})^2 \Rightarrow |AG| = 2\sqrt{6}$$

$$V = \frac{\text{Taban Alanı} \times \text{Yükseklik}}{3} = \frac{6^2\sqrt{3}}{4} \cdot \frac{2\sqrt{6}}{3}$$

$$V = 18\sqrt{2}$$

$$\text{Formül: } k \Rightarrow V = \frac{a^3\sqrt{2}}{12} = \frac{6^3\sqrt{2}}{12} = 18\sqrt{2}$$

Örnek:

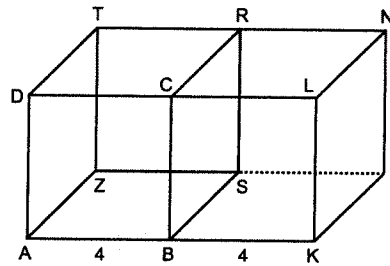


Bir ayrıtı 6 cm olan bir küp için; A noktasından başlayarak.

ABHG ve GHEF yüzeylerinden hareket eden bir karınca K noktasına en kısa kaç cm giderek ulaşır?

Cevap: 13

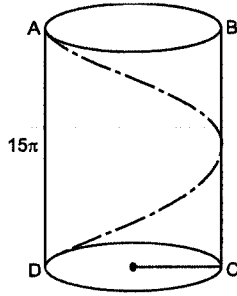
Örnek:



Şekildeki ayrıtları 4 cm olan küpler için. A noktasından hareket eden bir karınca N noktasına en kısa kaç cm de ulaşır?

Cevap: $8\sqrt{2}$

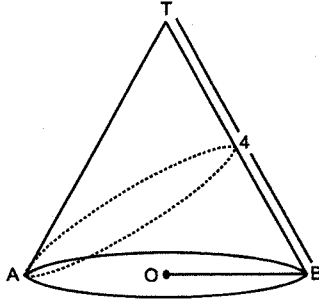
Örnek:



Yarıçapı 4 cm ve yüksekliği 15π olan bir silindir için A noktasından D noktasına hareket eden bir karıncanın silindiri bir tam dönerek alacağı en kısa yol kaç cm dir?

Cevap: 17π

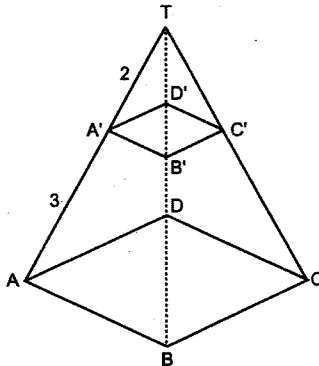
Örnek:



Yarıçapı 1 cm ve ana doğrusu 4 cm olan bir dik koni için A noktasından hareket ederek. Koni-nin etrafını bir tam dönen bir karıncanın alacağı en kısa yol kaçtır?

Cevap: $4\sqrt{2}$

Örnek:

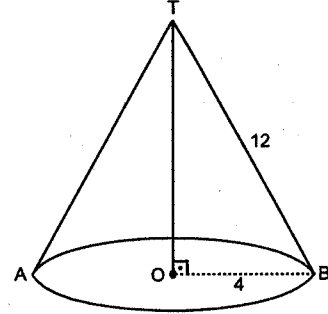


Şekildeki kare dik piramid için ABCD düzlemi $A'B'C'D'$ düzlemine paraleldir.

(T, $A'B'C'D'$) piramidinin hacminin (T, ABCD) piramidinin hacmine oranı kaçtır?

Cevap: $\frac{8}{125}$

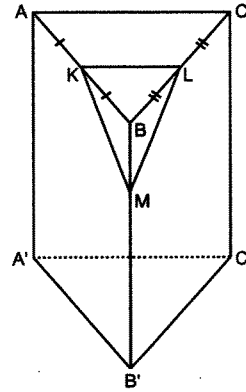
Örnek:



Şekildeki yarıçapı 4 cm ve ana doğrusu 12 cm olan bir dik koninin A köşesinden başlayan bir karınca B noktasına en kısa kaç cm de ulaşır?

Cevap: 12

Örnek:



Şekildeki üçgen dik prizmanın [AB], [BC] ve [BB'] doğrularının orta noktaları K, L, M dir.

(M, KBL) piramidinin hacminin üçgen prizmanın hacmine oranı kaçtır?

Cevap: $\frac{1}{24}$

Notlar:

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