AÇI

1. $2.m(\widehat{A}) = 72° 84' 68'' = 71° 144' 68''$

$3.m(\widehat{B}) = 63° 99' 63'' = 63° 99' 63''$

$2m(\widehat{A}) - 3.m(\widehat{B}) = 8° 45' 05''$

Cevap: A

2. $x + (6y - x) = 90$

$6y = 90$

$y = 15°$

$y + (5y + 2x) = 180$

$6y + 2x = 180$

$6.15 + 2x = 180$

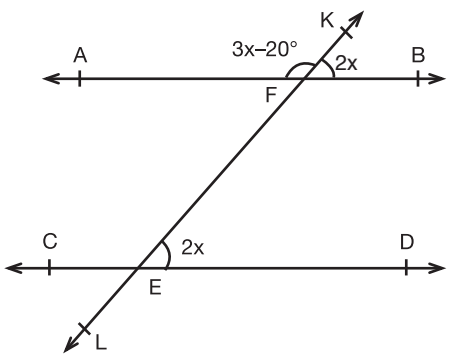
$2x = 90$

$x = 45°$

$x + y = 45 + 15 = 60°$

Cevap: C

3.



$m(\widehat{FED}) = m(\widehat{KFB})$ (Yöndeş açılar)

$m(\widehat{KFA}) + m(\widehat{KFB}) = 180°$ (Bütünler açılar)

$3x - 20 + 2x = 180$

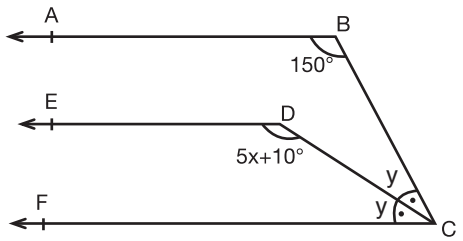
$5x = 200$

$x = 40°$

$m(\widehat{KFB}) = 2x = 2.40 = 80$

Cevap: E

4.



$m(\widehat{ABC}) + m(\widehat{BCF}) = 180$ (Karşı durumlu açılar)

$150 + 2y = 180$

$y = 15$

$m(\widehat{EDC}) + m(\widehat{DCF}) = 180°$ (Karşı durumlu açılar)

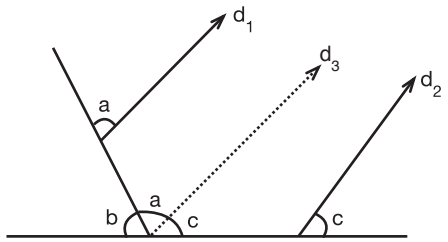
$5x + 10 + 15 = 180$

$5x = 155$

$x = 31°$

Cevap: C

5.

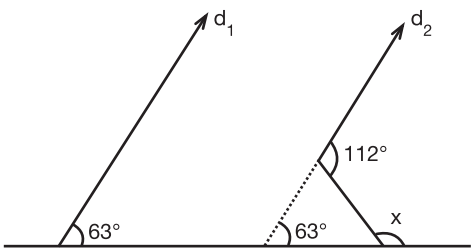


$a + c = 150$

$a + b + c = 180°$ $\quad a + c = 150° \Rightarrow b = 30°$

Cevap: C

6.



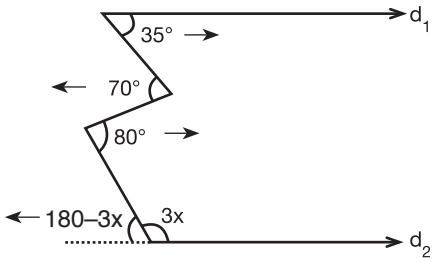
$x = ?$

$x = 68 + 63 = 131°$

Cevap: D

AÇI

7.

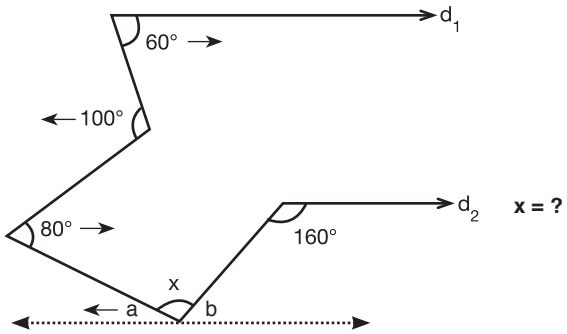


x = ?

35 + 80 = 70 + (180 – 3x)
115 = 250 – 3x
3x = 135
x = 45°

Cevap: D

9.



x = ?

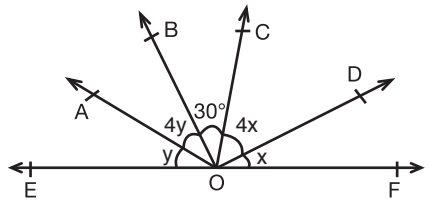
60 + 80 = 100 + a
a = 40°

160 + b = 180°
b = 20°

x + a + b = 180
x + 40 + 20 = 180 ⇒ x = 120°

Cevap: B

8.



$4m(\widehat{FOD}) = m(\widehat{COD})$
$4m(\widehat{EOA}) = m(\widehat{AOB})$

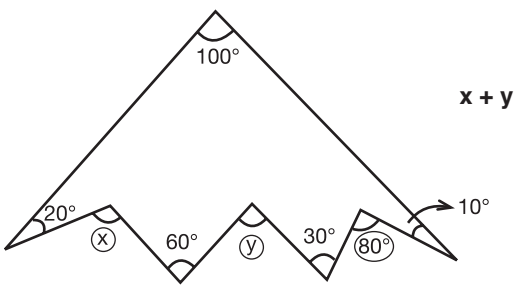
$5y + 30 + 5x = 180$
$5(x + y) = 150$
$x + y = 30$

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

$m(\widehat{AOD}) = 4x + 4y + 30$
$= 4(x + y) + 30$
$= 4.30 + 30$
$= 150$

Cevap: D

10.



x + y = ?

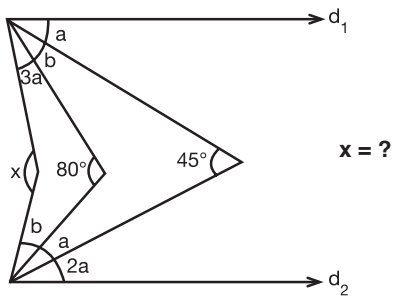
Kural: Şeklin içindeki açıların toplamı, dışındaki açıların toplamına eşittir.

100 + 20 + 60 + 30 + 10 = x + y + 80
x + y = 140°

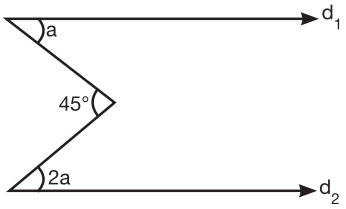
Cevap: A

AÇI

11.



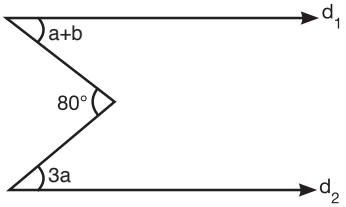
x = ?



$a + 2a = 45$

$3a = 45$

$a = 15°$

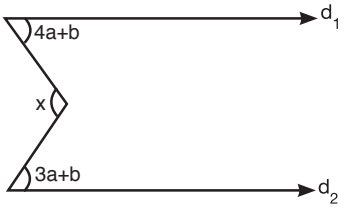


$a + b + 3a = 80$

$4a + b = 80$

$4.15 + b = 80$

$b = 20°$



$x = 4a + b + 3a + b$

$x = 7a + 2b$

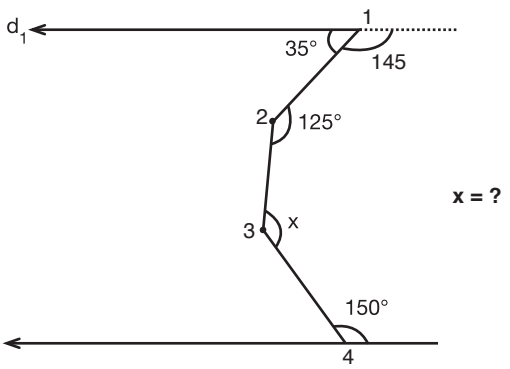
$x = 7.15 + 2.20$

$x = 105 + 40$

$x = 145°$

Cevap: B

12.



x = ?

KURAL: İki paralel doğru arasında kalan ve aynı yöne bakan açıların toplamı:
(Kırık nokta sayısı – 1).180

Kırık nokta sayısı = 4

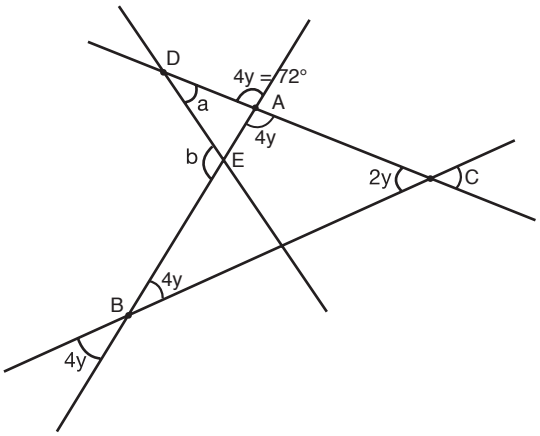
$x + 145 + 125 + 150 = (4–1).180$

$x = 120$

Cevap: C

AÇI – ÜÇGENDE AÇI

1.



ABC üçgeninin iç açıları toplamı 180° olduğundan

$4y + 4y + 2y = 180 \Rightarrow y = 18$

$4y = 72$

ADE üçgeninde iki iç açının toplamı kendilerine komşu olmayan bir dış açıya eşit olacağından,

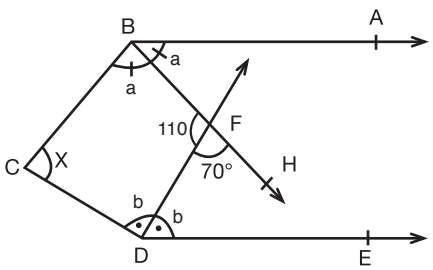
$a + 108 = b \Rightarrow b - a = 108°$ dir.

$$\begin{array}{rl} & b + a = 132 \\ + & b - a = 108 \\ \hline & 2b = 240 \end{array}$$

$b = 120$, $a = 12°$ dir.

Cevap: A

2.



$2a + x + 2b = 360$ ve $a + b + x + 110 = 360$

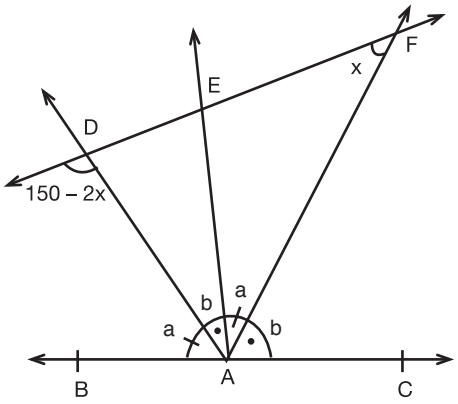
(–1 ile çarp) $a + b + x = 250°$

(2 ile genişlet)

$$\begin{array}{rl} & 2a + 2b + 2x = 500 \\ + & -2a - 2b - x = -360 \\ \hline & x = 140 \end{array}$$

Cevap: E

3.



$2a + 2b = 180 \Rightarrow a + b = 90°$ dir.

$m(\widehat{DAF}) = 90°$

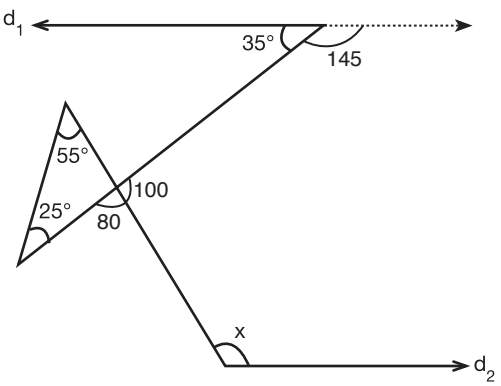
$x + 90 = 150 - 2x \quad (\widehat{DAF})$

$3x = 60$

$x = 20°$

Cevap: C

4.

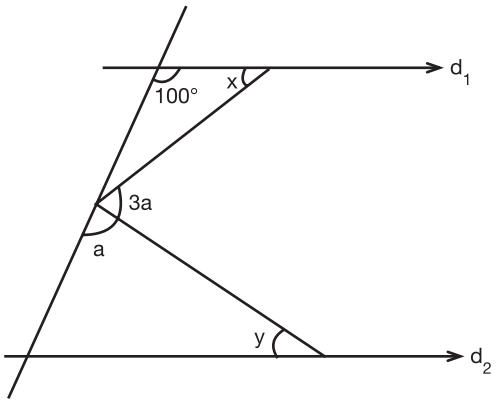


$145 + 100 + x = 360 \Rightarrow x = 115°$

Cevap: C

AÇI – ÜÇGENDE AÇI

5.



3 / $x + 100 = 4a \Rightarrow 3x + 300 = 12a$

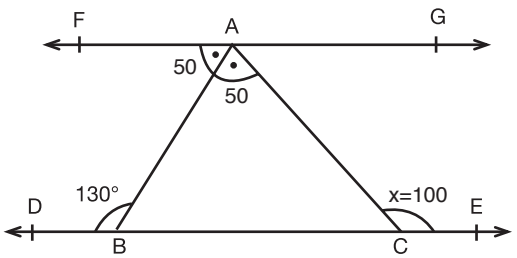
4 / $x + y = 3a \Rightarrow 4x + 4y = 12a$

$3x + 300 = 4x + 4y$

$x + 4y = 300$

Cevap: D

6.

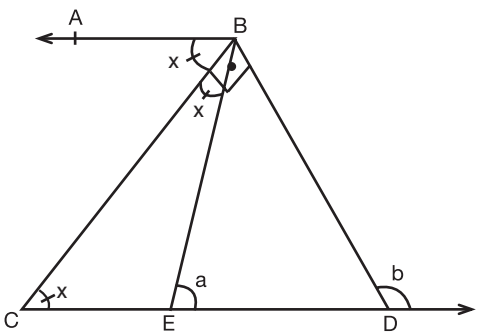


$m(\widehat{FAB}) = 50$ (Karşı durumlu açılar)

$m(\widehat{FAC}) = m(\widehat{ACE})$ (İç ters açılar)

Cevap: B

7.



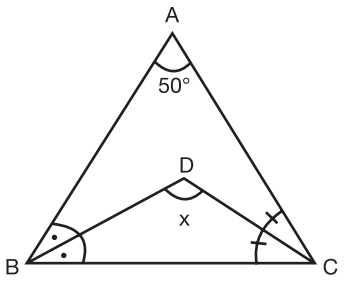
$b = 90 + x$ $\quad a = 2x$

$x = b - 90$ $\quad a = 2(b - 90)$

$a = 2b - 180$

Cevap: A

8.



I. yol:

$x = 90 + \frac{m(\widehat{A})}{2} \Rightarrow x = 90 + \frac{50}{2}$

$x = 115°$

II. yol:

$50 + 2a + 2b = 180$

$2a + 2b = 130$

$2(a + b) = 130$

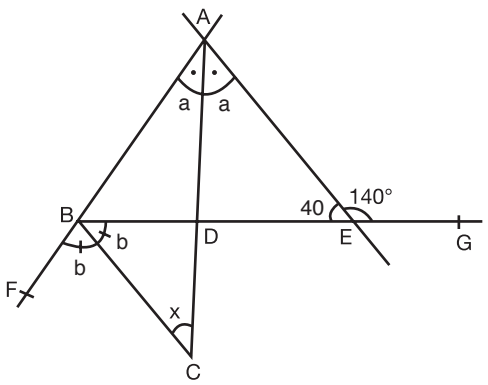
$a + b = 65$

$x + \underbrace{a + b}_{65} = 180°$

$x = 115°$

Cevap: C

9.



I. yol:

$x = \frac{m(\widehat{AEB})}{2} = \frac{40}{2} = 20°$

II. yol:

$2a + 40 = 2b \Rightarrow 2b - 2a = 40$ $(\widehat{AEB})$

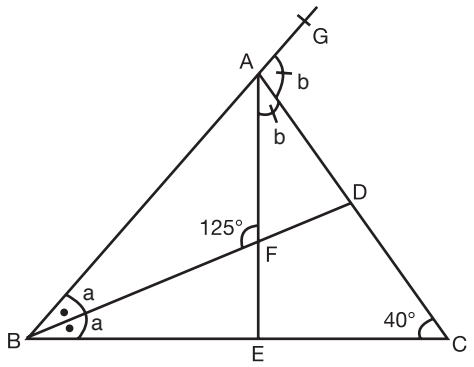
$b - a = 20$

$a + x = b \Rightarrow x = b - a = 20°$ $(\widehat{ABC})$

Cevap: B

AÇI – ÜÇGENDE AÇI

10.



• $2a + 40 = b \quad (\widehat{ABC})$

• $a + b + 40 = 125$

$a + b = 85$

$b = 85 - a$

$\Rightarrow 2a + 40 = 85 - a$

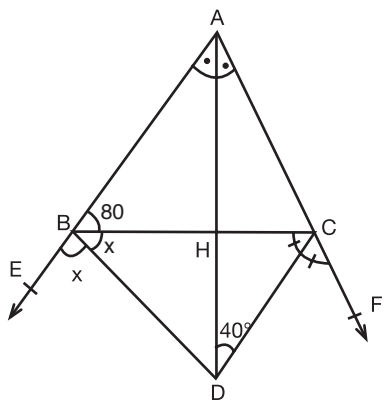
$3a = 45$

$a = 15$

$m(\widehat{ABC}) = 2a = 30°$

Cevap: E

11.



Kural:

[AD] ve [CD] açıortay ise [BD]'de açıortaydır.

$m(\widehat{ADC}) = \frac{m(\widehat{ABC})}{2} \Rightarrow 40 = \frac{m(\widehat{ABC})}{2}$

$\Rightarrow m(\widehat{ABC}) = 80°$

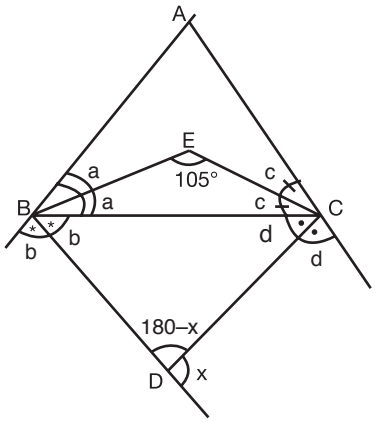
$2x + 80 = 180°$

$2x = 100°$

$x = 50°$

Cevap: C

12.



$2a + 2b = 180$

$a + b = 90$

$2c + 2d = 180$

$c + d = 90$

EBCD dörtgeninin iç açıları toplamı 360° dir.

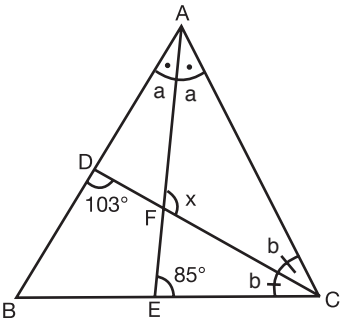
$105 + 90 + 90 + 180 - x = 360$

$x = 105°$

Cevap: A

ÜÇGENDE AÇI

1.



$2a + b = 103$ ($\widehat{ADC}$)

$a + 2b + 85 = 180$ ($\widehat{AEC}$) $\Rightarrow a + 2b = 95$

$2a + b = 103$

$+ \quad a + 2b = 95$

$3a + 3b = 198 \Rightarrow 3(a + b) = 198$ olur.

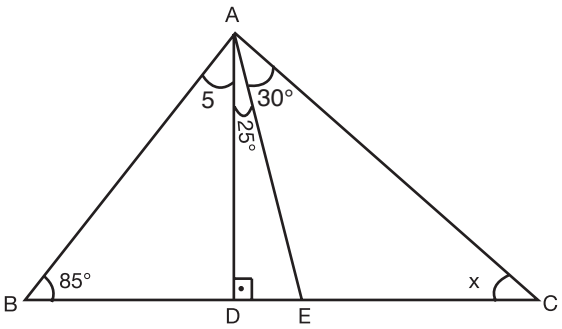
$a + b = 66$

$\underbrace{a + b}_{66} + x = 180$ ($\widehat{AFC}$)

$x = 114°$

Cevap: D

3.



I. yol:

$m(\widehat{BAE}) = m(\widehat{EAC}) = 30°$

$x + 55 + 90 = 180$

$x = 35°$

II. yol:

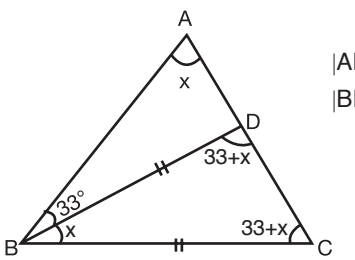
$m(\widehat{DAE}) = \dfrac{|m(\widehat{B}) - m(\widehat{C})|}{2}$

$25 = \dfrac{|85 - x|}{2}$

$x = 35$

Cevap: B

2.



$|AB| = |AC|$

$|BD| = |BC|$

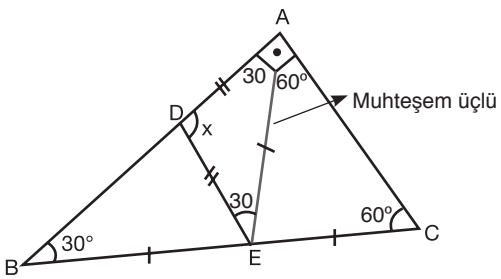
$x + (33 + x) + (33 + x) = 180°$

$3x = 114$

$x = 38°$

Cevap: A

4.

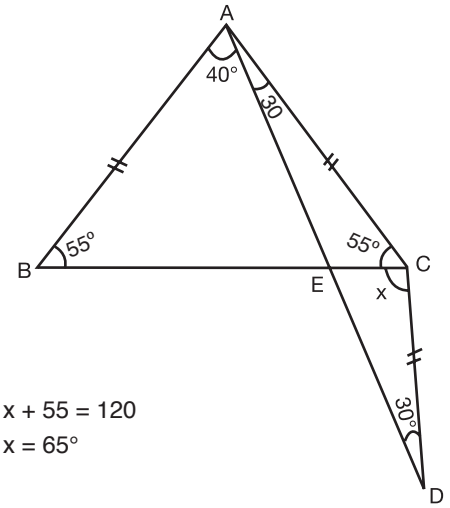


$x = 120°$

Cevap: D

ÜÇGENDE AÇI

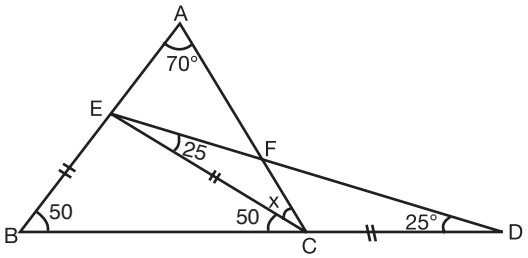
5.



x + 55 = 120
x = 65°

Cevap: A

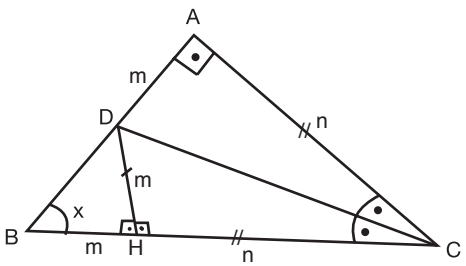
6.



70 + 50 + 50 + x = 180 $\Rightarrow$ x = 10°

Cevap: B

7.



|BC| = |AD| + |AC|

m + n = m + n

Kural

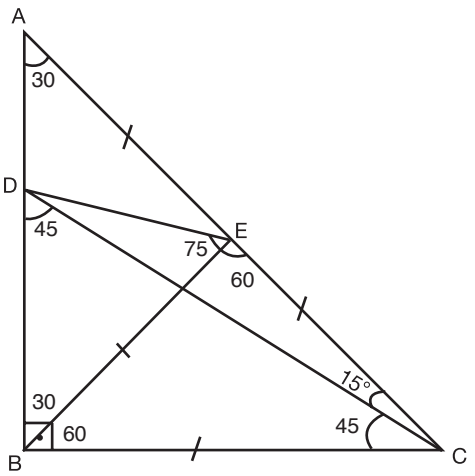
Açıortay üzerinden kollara indirilen dikmelerin uzunlukları ve açıortay kollarının uzunlukları birbirine eşittir.

m = |AD| = |DH| ve n = |AC| = |HC| dir.

Dolayısıyla |BH| = m dir. Yani BDH üçgeni ikizkenar dik üçgendir. x = 45°

Cevap: D

8.



$\widehat{DBC}$ ikizkenar dik üçgen |DB| = |BC|

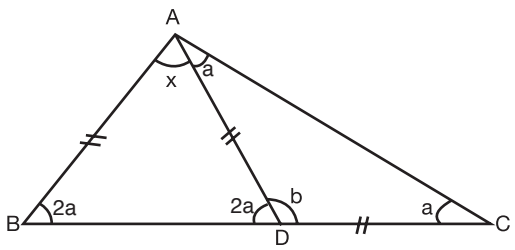
$\widehat{DBE}$ ikizkenar üçgen |DB| = |BE|

$m(\widehat{DBE}) = 30 \Rightarrow m(\widehat{DBE}) = m(\widehat{DEB}) = 75^o$

$x = 60^o + 75^o = 135^o$

Cevap: E

9.



$\cancel{2a}$ + b = 180

\+ b – $\cancel{2a}$ = 48

2b = 228

b = 114 ve a = 33

4a + x = 180

4.33 + x = 180

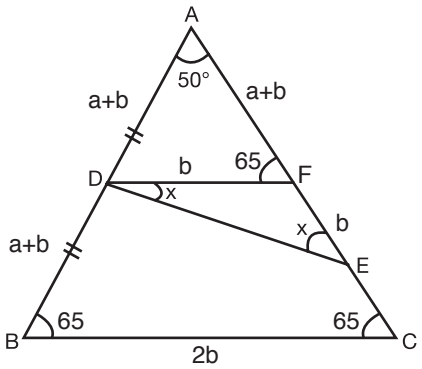
x = 180 – 132

x = 48°

Cevap: D

ÜÇGENDE AÇI

10.



$|AB| = |AC| = 2a + 2b$

$|EC| + |BC| = |AE|$

a 2b a+2b

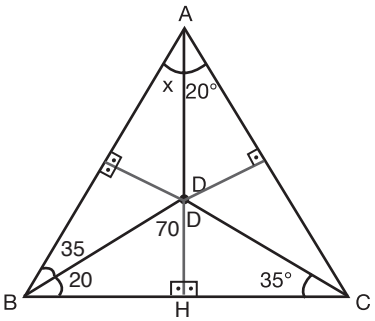
[DF] orta taban

$|DF| = \frac{|BC|}{2} = b$

$2x = 65 \Rightarrow x = 32{,}5°$

Cevap: B

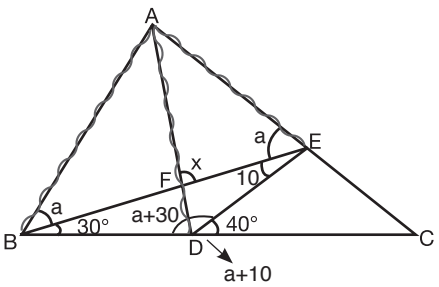
12.



$x = 35°$ $(\widehat{ABH})$

Cevap: A

11.



$(a + 30) + (a + 10) + 40 = 180$

$2a + 80 = 180$

$2a = 100$

$a = 50$

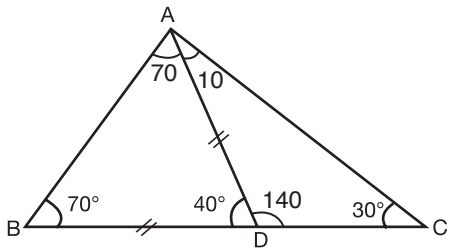
$x = a + 10 + 10$

$x = 70°$

Cevap: E

AÇI - KENAR BAĞINTILARI

1.



$\widehat{ABD}$ için $|AD| = |BD| > |AB|$

$\widehat{ADC}$ için $|AC| > |AD| > |DC|$

$\widehat{ABC}$ için $|BC| > |AC| > |AB|$

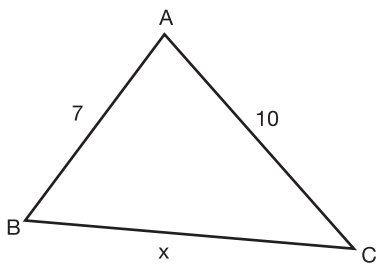
Sonuç olarak;

$|BC| > |AC| > |AD| = |BD| > |AB|$ ve

$|AD| > |DC|$ dir. $|DC| > |AD|$ ifadesi yanlıştır.

Cevap: C

2.



Genel kurala göre $3 < x < 17$

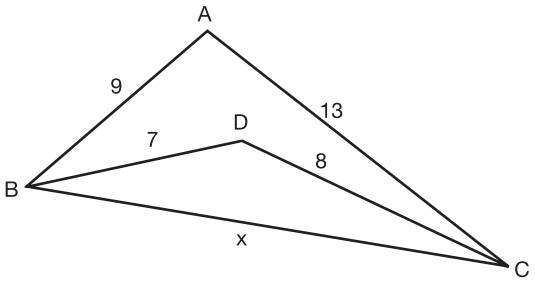
$m(\hat{B}) < m(\hat{A})$ için $10 < x$

Sonuç olarak $10 < x < 17$ olmalıdır.

x'in alabileceği 6 farklı değer vardır.

Cevap: B

3.



$\widehat{ABC}$ iken $|13 - 9| < x < |13 + 9|$

$4 < x < 22$

$\widehat{BDC}$ iken $|8 - 7| < x < |18 + 7|$

$1 < x < 15$

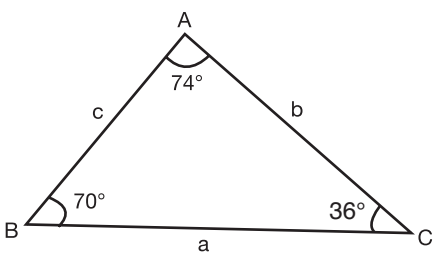
Sonuç olarak

$4 < x < 15$ olmalıdır. (En dar aralık seçilir.)

x'in alabileceği 10 farklı değer vardır.

Cevap: A

4.



$c < b < a'$ dır.

$|a - b| - |b - c| - |c - a|$

$\downarrow \quad \downarrow \quad \downarrow$

$b < a \quad c < b \quad c < a$

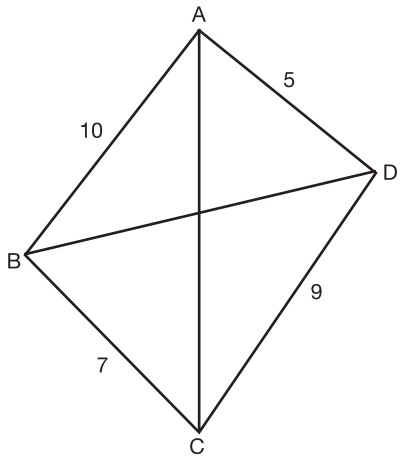
$(a - b) - (b - c) - (a - c) = \cancel{a} - b - b + c - \cancel{a} + c$

$= 2c - 2b$

Cevap: E

AÇI - KENAR BAĞINTILARI

5.



$\widehat{ABD}$ için $5 < |BD| < 15$

$\widehat{BCD}$ için $2 < |BD| < 16$

Sonuç olarak $5 < |BD| < 15$ olmalıdır.

$\widehat{ABC}$ için $3 < |AC| < 17$

$\widehat{ADC}$ için $4 < |AC| < 14$

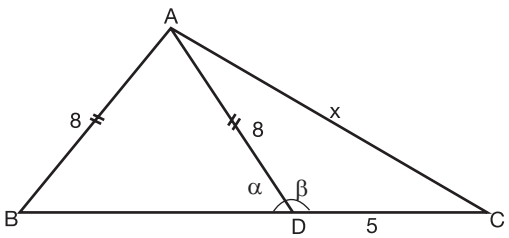
Sonuç olarak $4 < |AC| < 14$ olmalıdır.

$$\begin{array}{rl} & 5 < |BD| < 15 \\ + & 4 < |AC| < 14 \\ \hline & 9 < |BD| + |AC| < 29 \end{array}$$

$|BD| + |AC|$ 'nin abileceği en büyük değer 28 dir.

Cevap: C

6.



$\alpha < 90^o$ olmalıdır. Dolayısıyla $\beta > 90^o$ dir. Yani $\widehat{ADC}$'ni geniş açılı üçgendir.

$89^2 + 5^2 < x^2$ ve $3 < x < 13$

$89 < x^2$

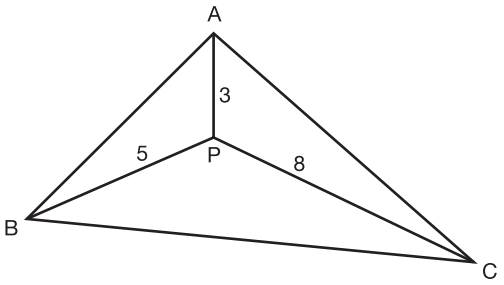
$\sqrt{89} < x$

Sonuç olarak $\sqrt{89} < x < 13$ tür.

x'in alabileceği en küçük değer 10'dur.

Cevap: B

7.



Kural

$|AP|+|BP|+|CP| < Ç(ABC) < 2.(|AP|+|BP|+|CP|)$

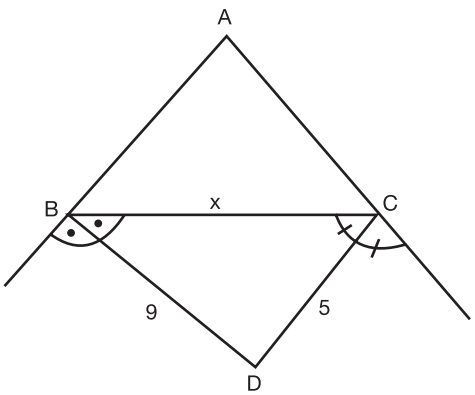
$3 + 5 + 8 < Ç(ABC) < 2.(3 + 5 + 8)$

$16 < Ç(ABC) < 32$ olmalıdır.

$Ç(ABC) = 33$ olamaz.

Cevap: E

8.



$m(\widehat{D}) = 90 - \frac{m(\widehat{A})}{2}$ 'dir. Yani $\widehat{D}$ dar açıdır.

Buna göre

$x^2 < 9^2 + 5^2$ ve $4 < x < 13$

$x^2 < 106$

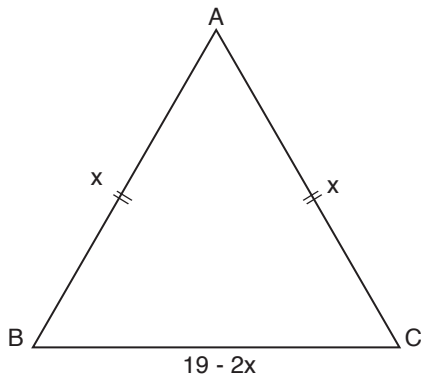
$x < \sqrt{106}$

Sonuç olarak $4 < x < \sqrt{106}$ $(\sqrt{106} = 10, ...)$

x'in alabileceği tamsayı değerleri 5, 6, 7, 8, 9, 10'dur.

Cevap: B

9.



$|19 - 2x - x| < x < |19 - 2x + x|$

$\underbrace{|19 - 3x| < x}_{I} < \underbrace{|19 - x|}_{II.}$

I. için $19 - 3x < x$ II. için $x < 19 - x$

$19 < 4x$ $2x < 19$

$\frac{19}{4} < x$ $x < \frac{19}{2}$

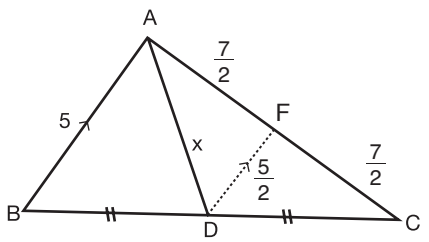
Sonuç olarak $\frac{19}{4} < x < \frac{19}{2}$

$4. ... < x < 9.5 ...$

x'in alabileceği tamsayı değerleri 5, 6, 7, 8, 9 dur.

Cevap: E

10.



[DF] // [AB] çizilir. (Orta taban)

$|AF| = |FC| = \frac{7}{2}$

$|DF| = \frac{|AB|}{2} = \frac{5}{2}$ dir.

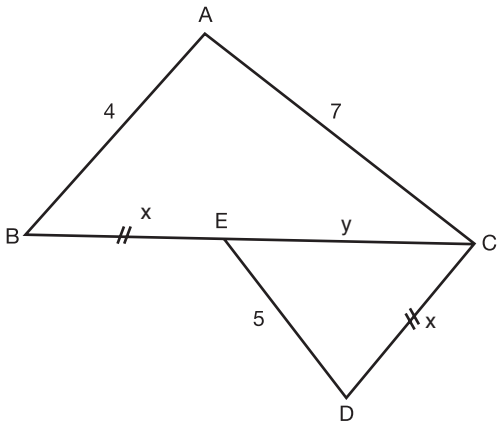
$\widehat{ADF}$ için $\left|\frac{7}{2} - \frac{5}{2}\right| < x < \left|\frac{7}{2} + \frac{5}{2}\right|$

x'in alabileceği tamsayı değerleri 2, 3, 4, 5 tir.

2 + 3 + 4 + 5 = 14 tür.

Cevap: C

11.



$\widehat{ABC}$ için $|7 - 4| < |BC| < |7 + 4|$

$3 < |BC| < 11$ dir.

$3 < x + y < 11$

$\widehat{EDC}$ için $|x - y| < 5 < |x + y|$

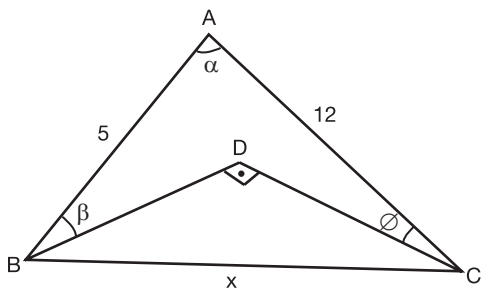
Sonuç olarak $5 < x + y < 11$ olmalıdır.

$5 < |BC| < 11$

|BC| 'nin alabileceği 5 farklı değer vardır.

Cevap: A

12.



$\alpha + \beta + \varnothing = 90$ olduğundan $\alpha < 90$ dır diyebiliriz.

Yani $\widehat{ABC}$ üçgeni dar açılı üçgendir.

$x^2 < 5^2 + 12^2$ ve $|12 - 5| < x < |12 + 5|$

$x^2 < 169$ $7 < x < 17$

$x < \sqrt{169}$

$x < 13$

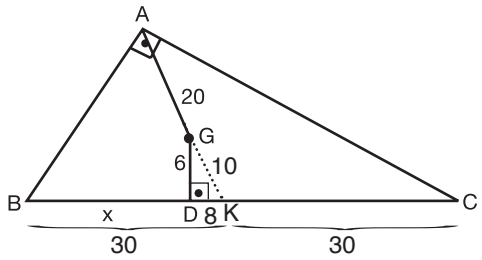
Sonuç olarak

$7 < x < 13$ olmalıdır. x'in alabileceği en büyük tamsayı değeri 12'dir.

Cevap: E

KENARORTAY

1.



|AG| = 2 |GK| ⇒ |GK| = 10 br

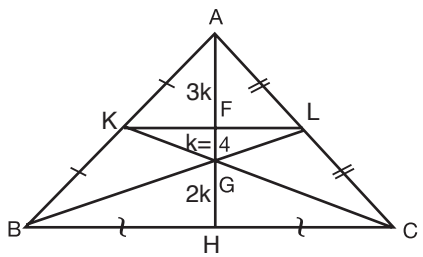
$\widehat{GDK}$ üçgeninde |DK| = 8 br (6, 8, 10 üçgeni)

m($\hat{A}$) = 90 ⇒ |AK| = |BK| = |KC| = 30 br (Muhteşem üçlü)

x = 22 br'dir.

Cevap: E

2.



k = 4 ise 6k = 24'tür.

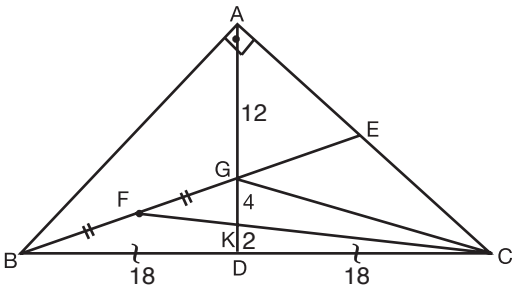
Not: • [KL] orta tabandır. Yani |AF| = |FH|

• G ağırlık merkezidir. Yani 2 |GH| = |AG|'dir.

Bu iki eşitliği sağlayan oran (3k, k, 2k)

Cevap: C

3.



BGC üçgeninde [GD] ve [FC] kenarortay olduğundan K noktası bu üçgenin ağırlık merkezidir.

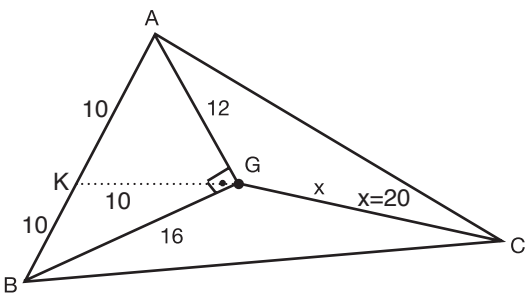
2 |KD| = |GK| ⇒ |KD| = 2 br

2 |GD| = |AG| ⇒ |AG| = 12 br

m($\hat{A}$) = 90° ve |AD| = 18 br ⇒ |BC| = 36 br (Muhteşem üçlü)

Cevap: E

4.



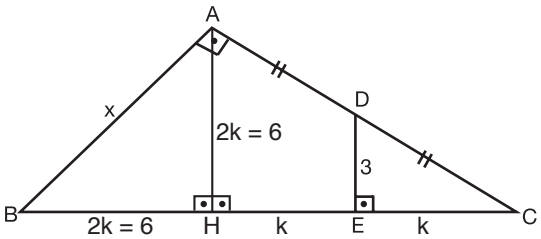
$\widehat{ABD}$ için |AB| = 20 br (12, 16, 20 üçgeni) |KG| = 10 br (Muhteşem üçlü)

x = |GC| = 2 |KG| = 20 br

Cevap: D

KENARORTAY

5.



4 |EC| = |BC|

|EC| = k dersek |BC| = 4k olur.

[AH] dikmesini indirirsek |HE| = |EC| = k olur.

Dolayısıyla |BH| = 2k olur. ($\widehat{AHC}$)

$\widehat{ABC}$'de m($\hat{A}$) = 90° ve |BH| = |HC| olduğundan

|AH| = 2k olur. (Muhteşem üçlü)

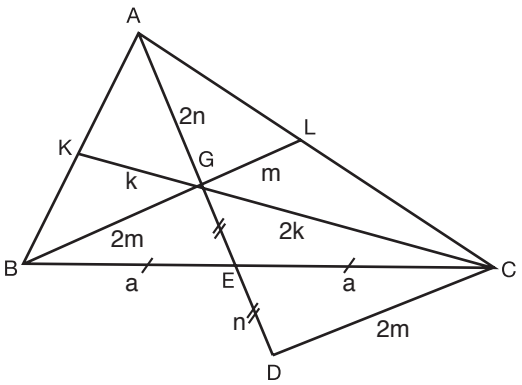
$\widehat{AHC}$'de |AH| = 2 |DE| olduğundan |AH| = 6 br

$\widehat{ABH}$ üçgeni ikizkenar dik üçgendir.

$x = 6\sqrt{2}$ br'dir.

Cevap: C

6.



|AE| + |BL| + |KC| = 36 br

|GE| = |ED|

3k + 3m + 3n = 36

3(k + m + n) = 36

k + m + n = 12 br

$\widehat{EBG}$ ve $\widehat{ECD}$ üçgenleri eş üçgenleri
(Kenar - Açı - Kenar)

Dolayısıyla |DC| = 2m br'dir.

Ç(GDC) = 2k + 2m + 2n

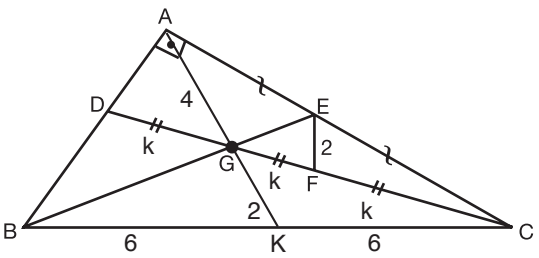
= 2(k + m + n)

= 2 . 12

= 24 br'dir.

Cevap: A

7.



|DG| = |FC| = k dersek

2. |DG| = |GC| olduğundan |GF| = k olur.

AGC üçgeninde [EF] orta taban olduğundan |AD| = 4 br'dir.

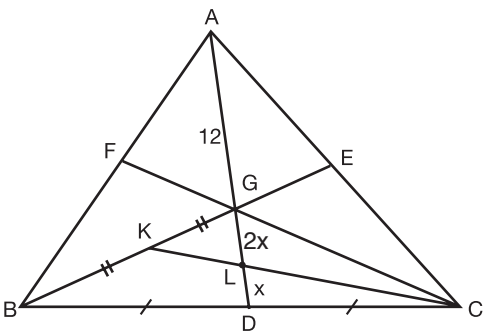
|GK| = 2 br ve |AK| = 6 br olur.

|BC| = 2 |AK| (Muhteşem üçlü)

|BC| = 2 . 6 = 12 br

Cevap: C

8.



BGC üçgeninde [KC] ve [GD] kenarortay olduğundan L noktası bu üçgenin ağırlık noktasıdır.

|LD| = x ⇒ |GL| = 2x'tir.

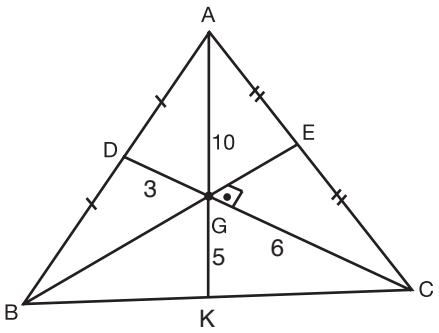
ABC üçgeninde |AG| = 12 , |GD| = 3x = 6 br

⇒ x = 2 br'dir.

Cevap: B

KENARORTAY

9.



$V_b \perp V_c$ olduğundan $V_a^2 = V_b^2 + V_c^2$'dir.

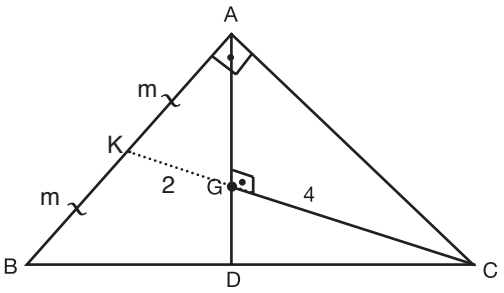
$V_a = 15$ br $\quad V_c = 9$ br $\quad V_b = ?$

$15^2 = 9^2 + V_b^2$

$V_b^2 = 144 \Rightarrow V_b = |BE| = 12$ br'dir.

Cevap: C

11.



AKC üçgeninde öklid teoremi uygularsak

$m^2 = 2\,(2 + 4) = 12$

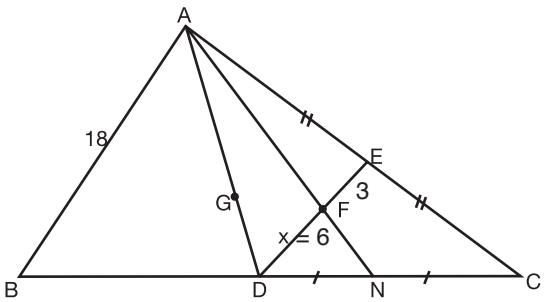
$m^2 = 12$

$m = 2\sqrt{3} \qquad x = 2m = 2 \cdot 2\sqrt{3}$

$x = 4\sqrt{3}$

Cevap: B

10.



ADC üçgeninde F noktası ağırlık merkezidir.

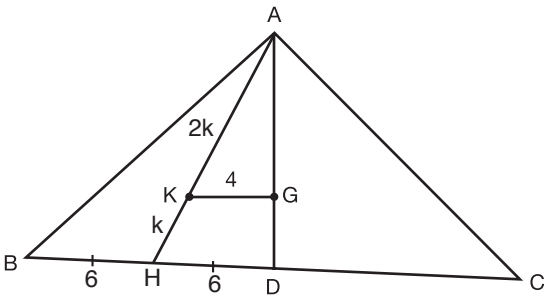
ABC üçgeninde [DE] orta tabandır.

$|DE| = \dfrac{|AB|}{2} = 9$ br'dir. $\qquad |FE| = 3$ br

$|DF| = X = 6$ br'dir.

Cevap: E

12.



AHD üçgeninde benzerlik uygularsak

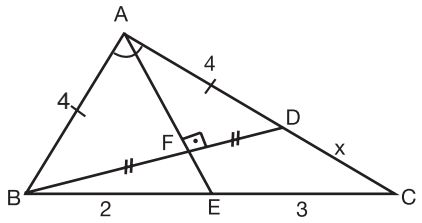
$\dfrac{|AK|}{|AH|} = \dfrac{2k}{3k} = \dfrac{|KG|}{|HD|} \Rightarrow |HD| = 6$ br

$|BD| = |DC| = 12$ br $\Rightarrow |BC| = 24$ br'dir.

Cevap: D

AÇIORTAY

1.



ABC üçgeninde

[AF] yükseklik ve kenarortay ise aynı zamanda açıortaydır ve

ABD üçgeni ikizkenar üçgendir.

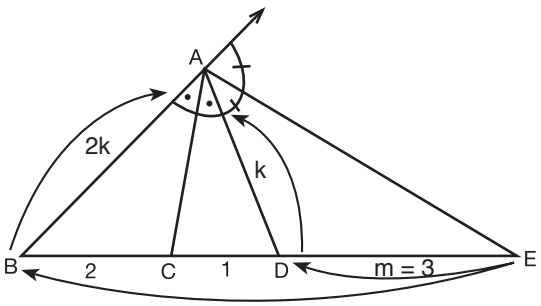
$|ABI = |ADI = 4$ br

ABC üçgeninde iç açıortay teoremine göre

$\frac{|AB|}{|BE|} = \frac{|AC|}{|EC|}$'dir. $\quad \frac{4}{2} = \frac{4+x}{3} \Rightarrow x = 2$ br

Cevap: D

2.



ABC üçgeninde iç açıortay teoremine göre

$\frac{|AB|}{|AD|} = \frac{|BC|}{|CD|} = \frac{2}{1}$ $\quad |AB| = 2k$ dersek

$|AD| = k$ olur.

ABD üçgeninde dış açıortay teoremine göre

$\frac{|DE|}{|BE|} = \frac{|AD|}{|AB|} = \frac{1}{2}$ $\quad |DE| = m$ dersek

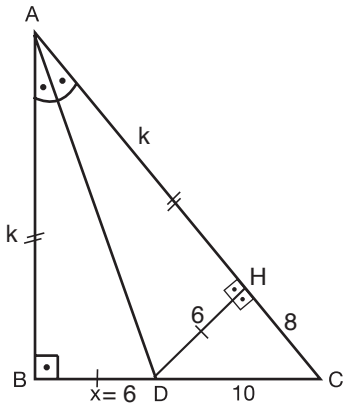
$|BE| = 2m$ olur.

$2m = 3 + m \Rightarrow m = 3$'tür.

$\frac{|BC|}{|BE|} = \frac{2}{6} = \frac{1}{3}$

Cevap: C

3.



$|AB| = k$ dersek $|AE| = k + 8$ olur.

Açıortay üzerindeki aynı noktadan kollara indirilen dikmeler kolları aynı oranda böler ve uzunlukları eşittir. Dolayısıyla

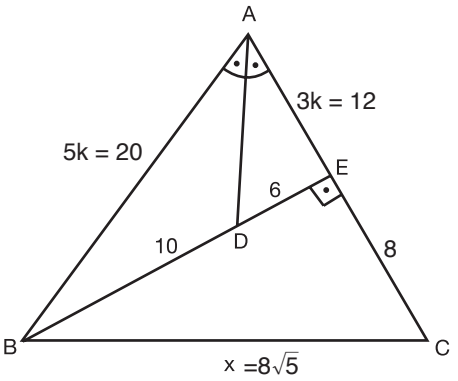
$|AB| = |AH| = k$ ve $|BD| = |DH| = x$'tir.

$|HC| = 8$ ve DHC dik üçgeninde (6, 8, 10)

$|DH| = x = 6$ br'dir.

Cevap: C

4.



ABD üçgenin iç açıortay teoremine göre

$\frac{|AB|}{|AE|} = \frac{|BD|}{|DE|} = \frac{10}{6}$'dır. $\quad |AB| = 5k$ dersek

$|AE| = 3k$ olur.

ABD dik üçgeni (12, 16, 20) üçgenidir.

$|AB| = |AC|$ olduğundan $|EC| = 8$ br'dir.

EBC dik üçgeninde pisagor uygulanırsa

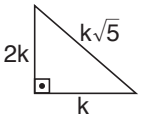
$|EB|^2 + |EC|^2 = |BC|^2$

$16^2 + 8^2 = x^2$

$x = 8\sqrt{5}$

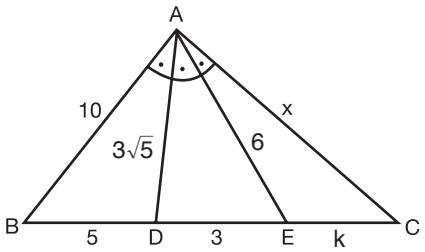
Cevap: D

Not:



AÇIORTAY

5.



ABE üçgeninde iç açıortay teoremine göre

$|AE| = 6$ br'dir.

ABE üçgeninde iç açıortay uzunluk teoremine göre

$|AD|^2 = |AB| \cdot |AE| - |BD| \cdot |DE|$

$|AD|^2 = 10 \cdot 6 - 5 \cdot 3 = 45$

$|AD| = 3\sqrt{5}$

ADC üçgeninde $\frac{|AD|}{|DE|} = \frac{|AC|}{|EC|} = \frac{3\sqrt{5}}{3} = \sqrt{5}$'tir.

$|AC| = k\sqrt{5}$ dersek $|EC| = k$ olur.

ADC üçgeninde iç açıortay uzunluk teoremine göre

$|AE|^2 = |AD| \cdot |AC| - |DE| \cdot |EC|$

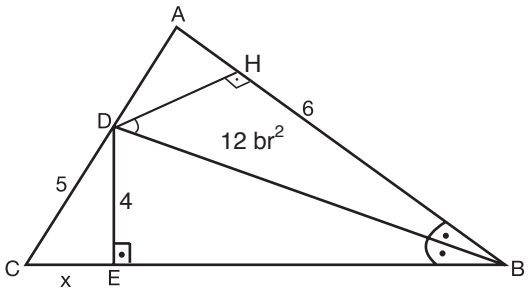
$6^2 = 3\sqrt{5} \cdot k\sqrt{5} - 3 \cdot k$

$36 = 12k$

$k = 3$ $\quad x = k\sqrt{5} = 3\sqrt{5}$ ' tir.

Cevap: C

6.



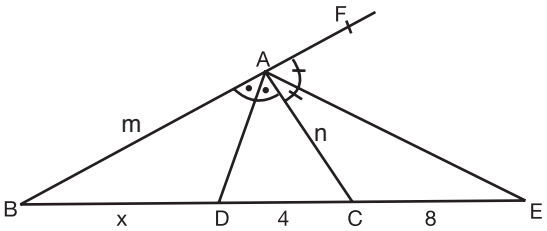
$A(ABD) = 12$ br^2 $\Rightarrow \frac{|DH| \cdot 6}{2} = 12$ ve $|DH| = 4$ br

$|DH| = |DE|$ olduğundan $|DE| = 4$ br'dir.

DEC üçgeni (3, 4, 5) üçgenidir. $x = 3$ br'dir.

Cevap: C

7.



ABC üçgenin iç açıortay teoremine göre

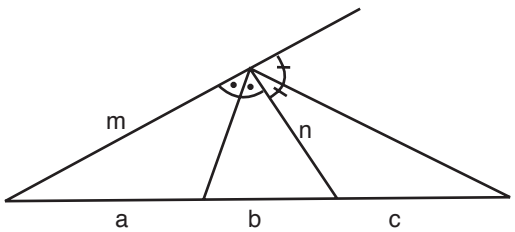
$\frac{m}{n} = \frac{x}{4}$

Dış açıortay teoremine göre $\frac{m}{n} = \frac{x+12}{8}$'dir.

$\frac{x}{4} = \frac{x+12}{8} \Rightarrow x = 12$ br'dir.

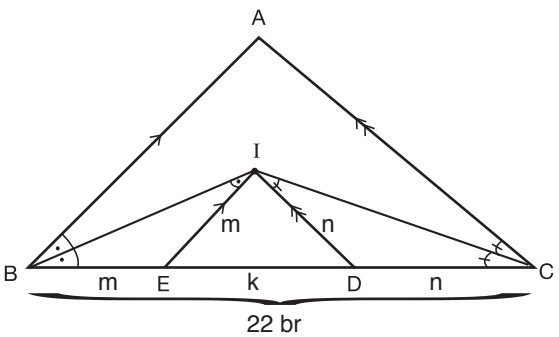
Cevap: D

Not:



$\frac{a-b}{a+b} = \frac{b}{c}$'dir. $\left(\frac{x-4}{x+4} = \frac{4}{8},\ x = 12\,\text{br}\right)$

8.

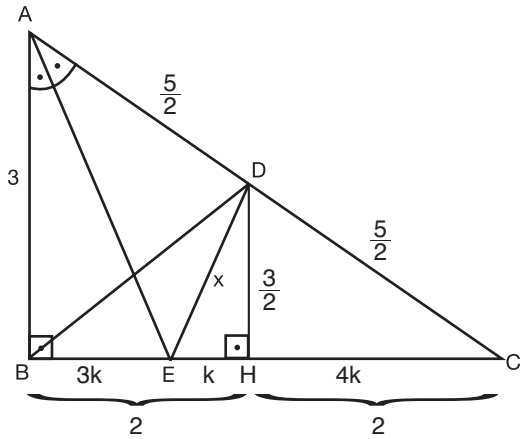


$m + k + n = 22$ br ve Ç(IED) = $m + k + n$ olduğundan Ç(IED) = 22 br'dir.

Cevap: A

AÇIORTAY

9.



$m(\widehat{B}) = 90^o$ ve $|BDI| = |ADI| = \frac{5}{2} \Rightarrow |DCI| = \frac{5}{2}$

(Muhteşem üçlü)

ABC dik üçgeni (3, 4, 5) üçgenidir.

$|DH| = \frac{3}{2}$'dir.

(Orta taban olduğundan) $|BHI| = |HCI| = 2$'dir.

ABC üçgeninde iç açıortay teoremine göre

$\frac{|AB|}{|AC|} = \frac{|BE|}{|EC|} = \frac{3}{5}$ $\quad |BE| = 3k$ dersek

$|EC| = 5k$ olur.

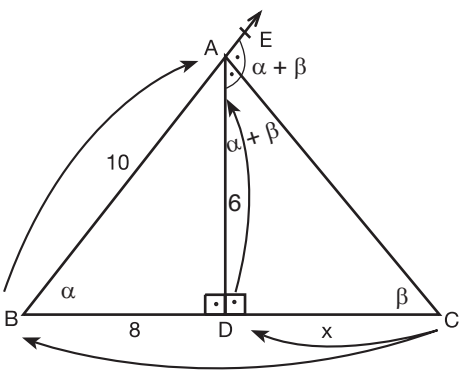
$3k + 5k = 4 \Rightarrow k = \frac{1}{2}$

DHE dik üçgenin pisagor uygulanırsa

$x^2 = \left(\frac{3}{2}\right)^2 + \left(\frac{1}{2}\right)^2 = \frac{10}{4} \Rightarrow x = \frac{\sqrt{10}}{2}$'dır.

Cevap: B

10.



ABD dik üçgeni (6, 8, 10) üçgenidir. $|ADI| = 6$ br

ABC üçgeninde $\widehat{EAC}$ dış açısı $m(\widehat{B}) + m(\widehat{C})$ eşit olduğundan $m(\widehat{EAC}) = \alpha + \beta$ 'dır.

ABD üçgeninde dış açıortay teoremine göre

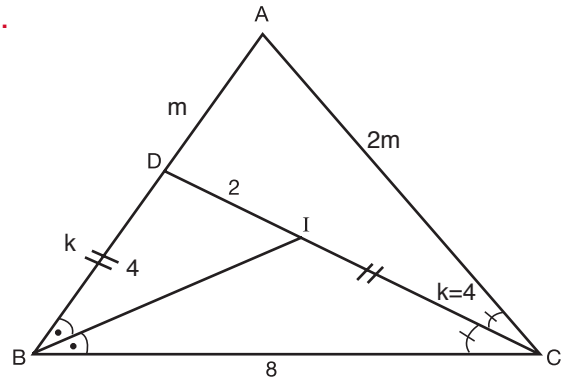
$\frac{x}{x+8} = \frac{6}{10} = \frac{3}{5}$ $\quad 5x = 3x + 24$

$2x = 24$

$x = 12$ br'dir.

Cevap: A

11.



BDC üçgeninde iç açıortay teoremine göre

$\frac{k}{2} = \frac{8}{k}$ $\quad k^2 = 16 \Rightarrow k = 4$'tür.

ABC üçgeninde iç açıortay teoremine göre

$\frac{|BC|}{|BD|} = \frac{|AC|}{|AD|} = \frac{8}{4} = 2$ $\quad |AC| = 2m$ dersek

$|AD| = m$ olur.

ABC üçgeninde iç açıortay uzunluk teoremine göre

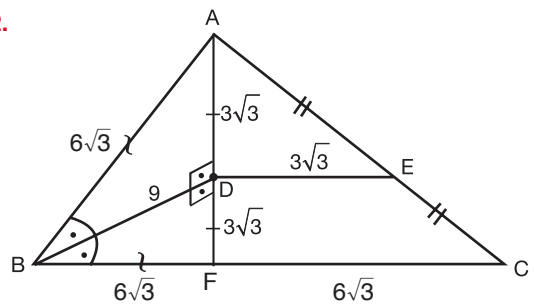
$|DCI|^2 = |ACI| \cdot |BCI| - |ADI| \cdot |BDI|$

$6^2 = 2m \cdot 8 - m \cdot 4$

$36 = 12\,m$ $\quad x = 2m = 6$ br

Cevap: B

12.



[AF] uzunluğu çizilirse

AFC üçgeninde [DE] orta taban olur.

$2 \cdot |DEI| = |FCI| \Rightarrow |FCI| = 6\sqrt{3}$, $|BFI| = 6\sqrt{3}$ olur.

ABF üçgeninde [BD] hem açıortay hem kenarortay olduğundan aynı zamanda yükseklik olur.

ABF üçgeni ikizkenar üçgen olmuş olur.

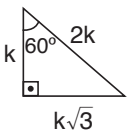
$|ABI| = |BFI| = 6\sqrt{3}$ 'tür.

ABD üçgeninde pisagor uygulanırsa $|ADI| = 3\sqrt{3}$ olduğu görülür. ABD üçgeni (30, 60, 90) üçgenidir.

$m(\widehat{ABD}) = 30^o$ dir.

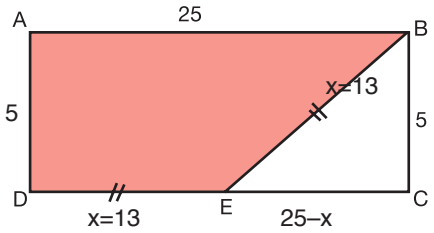
Cevap: C

Not:



DİK ÜÇGEN

1.



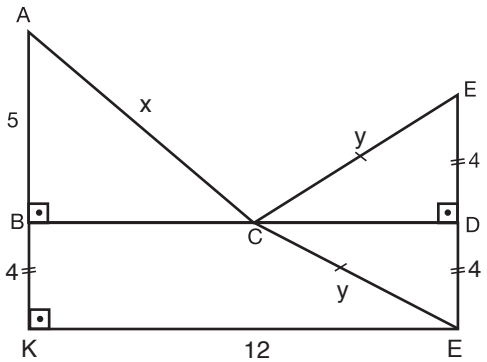
BEC üçgeni (5, 12, 13) üçgenidir.

x = 13'tür.

Ç(ADEB) = 5 + 25 + 13 + 13 = 56 br

Cevap: E

2.

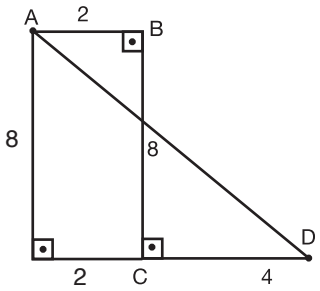


AKE üçgeni (9, 12, 15) üçgenidir.

|AC| + |CE| = x + y = 15'dir.

Cevap: C

3.

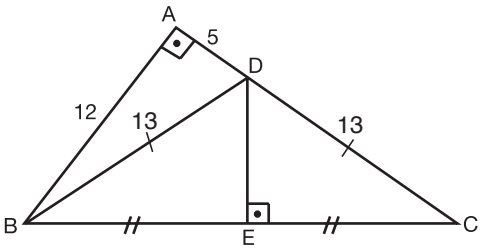


AHD üçgeni (6, 8, 10) üçgenidir.

|AD| = 10 br'dir.

Cevap: B

4.



ABD üçgeni (5, 12, 13) üçgenidir.

DBC üçgeninde [DE] hem yükseklik, hem kenarortay olduğundan DBC ügeni ikizkenar üçgendir.

|DC| = 13 br

ABC dik üçgeninde pisagor uygularsak

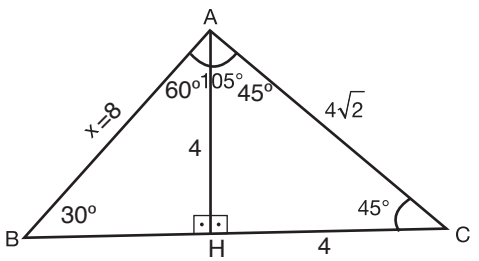
$12^2 + 18^2 = |BC|^2$

$468 = |BC|^2$

$|BC| = 6\sqrt{13}$ 'tür.

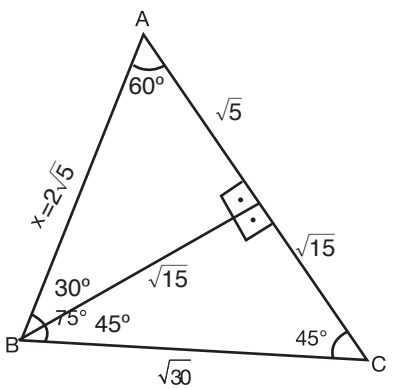
Cevap: C

5.



Cevap: E

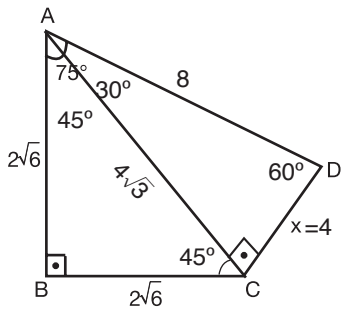
6.



Cevap: A

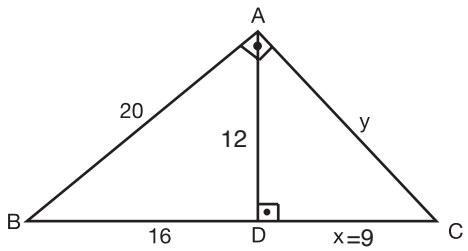
DİK ÜÇGEN

7.



Cevap: D

8.



ABD üçgeni (12, 16, 20) üçgenidir. $|AD| = 12$ br.

ABC üçgeninde öklid teoremi gereği

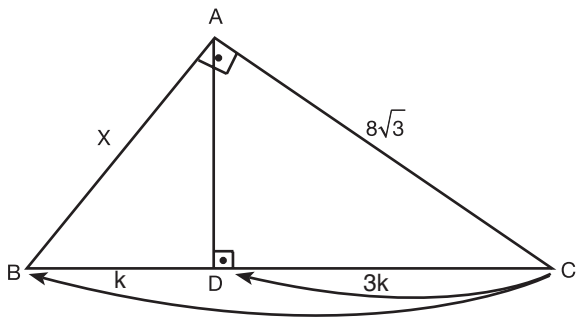
$12^2 = 16 \cdot x \Rightarrow x = 9$ br

ADC üçgeni (9, 12, 15) üçgenidir. $|AC| = y = 15$ br'dir.

$x + y = 9 + 15 = 24$ br'dir.

Cevap: D

9.



$\widehat{ABC}$'de öklid teoremi gereği

$(8\sqrt{3})^2 = 3k \cdot 4k$

$192 = 12k^2$

$k^2 = 16$

$k = 4$ br'dir.

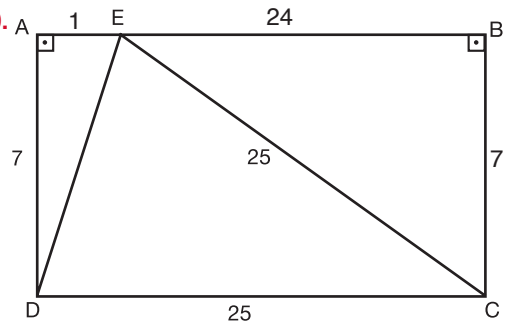
$x^2 = k \cdot 4k$

$x^2 = 4 \cdot 16 = 64$

$x = 8$ br'dir.

Cevap: C

10.

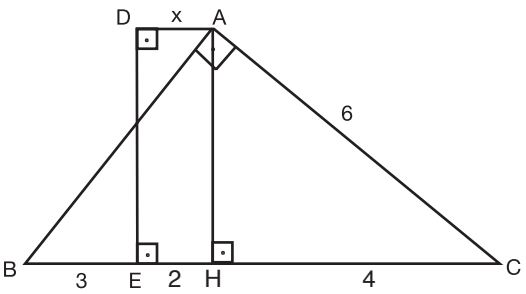


$\widehat{EBC}$ (7, 24, 25) üçgenidir. $|EB| = 24$ br

$|AE| = 1$ br'dir.

Cevap: A

11.



$\widehat{ABC}$'de öklid gereği

$|AC|^2 = |HC| \cdot |BC|$

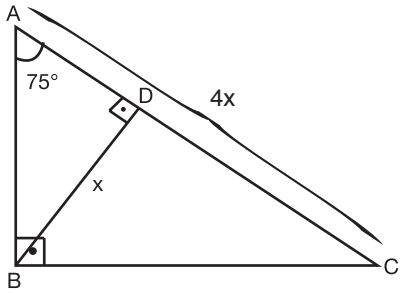
$6^2 = |HC| \cdot 9 \Rightarrow |HC| = 4$ br

AHED dikdörtgeninde $|AD| = |EH| = x = 2$ br

Cevap: B

DİK ÜÇGEN

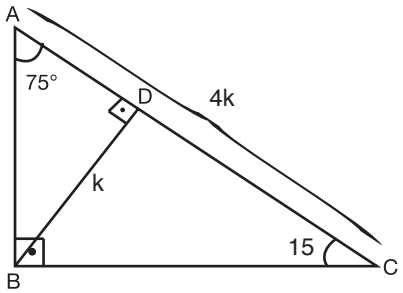
12.



(15, 75, 90) üçgenin dik köşeden hipotenüze indirilen dikme hipotenüsün $\frac{1}{4}$'ne eşittir.

$x + 4x = 25 \Rightarrow x = 5$ br'dir.

Not:



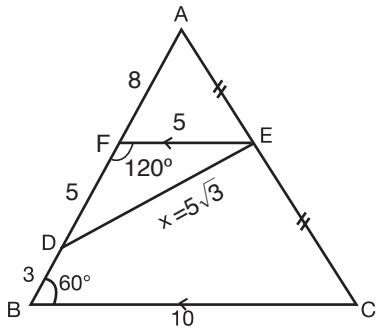
(15, 75, 90) üçgenin dik köşeden hipotenüse indirilen dikme hipotenüsün $\frac{1}{4}$'ine eşittir.

$x + 4x = 25 \Rightarrow x = 5$ br'dir.

Cevap: B

ÖZEL ÜÇGENLER

1.



[EF] orta taban $|FB| = |FA| = 8$ br

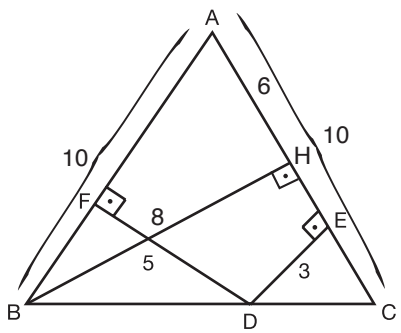
ve $|EF| = \frac{|BC|}{2} = \frac{10}{2} = 5$ br dir.

FDE üçgeni (30, 30, 120) üçgendir.

$x = 5\sqrt{3}$ 'tür.

Cevap: C

2.



ABC ikizkenar üçgeninde

$|BH| = |FD| + |ED| = 5 + 3 = 8$ br'dir.

ABH üçgeni (6, 8, 10) üçgenidir.

$|AH| = 6$, $|HC| = 4$ br'dir.

BHC üçgeninde pisagor uygulanırsa

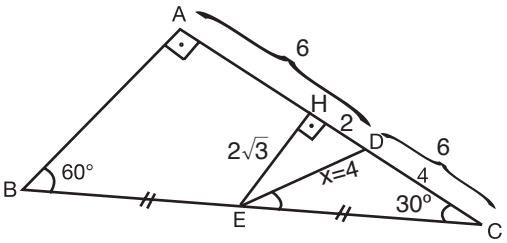
$|BH|^2 + |HC|^2 = |BC|^2$

$8^2 + 4^2 = |BC|^2$

$|BC| = 4\sqrt{5}$ br'dir.

Cevap: E

3.



[HE] orta taban olduğundan $|AH| = |HC| = 6$ br

ve $|HD| = 2$ br'dir.

HEC üçgeni (30, 60, 90)'dır.

$|HC| = 6$ br $\Rightarrow |HE| = 2\sqrt{3}$ br

HED üçgeninde pisagor uygulanırsa

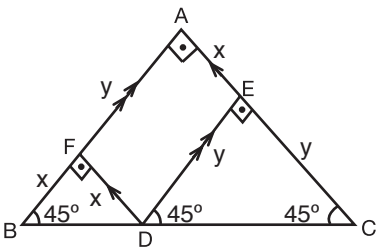
$|HD|^2 + |HE|^2 = x^2$

$2^2 + (2\sqrt{3})^2 = x^2$

$x = 4$ br

Cevap: B

4.

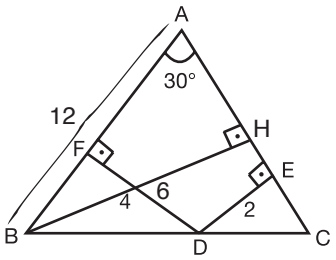


$x + y = 5\sqrt{2}$ br ve ABC ikizkenar dik üçgen olduğundan $|BC| = (5\sqrt{2}).\sqrt{2} = 10$ br'dir.

Cevap: E

ÖZEL ÜÇGENLER

5.



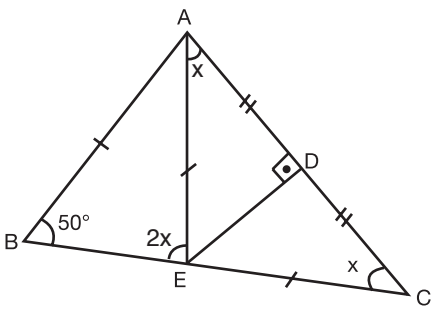
|BH| = |FD| + |DE| = 4 + 2 = 6 br

ABH üçgeni (30, 60, 90) üçgenidir.

|BH| = 6 br ⇒ |AB| = 12 br'dir.

Cevap: D

6.



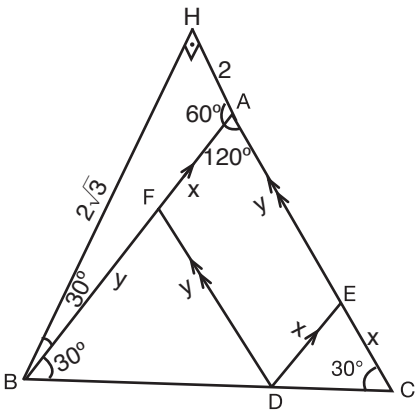
AEC ikizkenar üçgendir |AE| = |EC|

BAE ikizkenar üçgendir. $m(\hat{B}) = m(\hat{E})$

50 = 2x ⇒ x = 25°

Cevap: A

7.



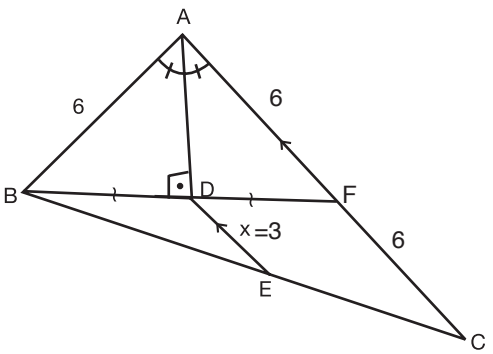
B'nin [AC]'ye en kısa uzaklığı B'den AC'ye indirilen dikmenin uzunluğudur. |BH| = $2\sqrt{3}$'tür.

ABH üçgeni (30, 60, 90) üçgenidir.

|BH| = $2\sqrt{3}$ ⇒ |AB| = x + y = |DE| + |DF| = 4 br'dir.

Cevap: C

8.



ABF üçgeni ikizkenardır. |AB| = |AF| = 6 br'dir.

|FC| = 6 br olur.

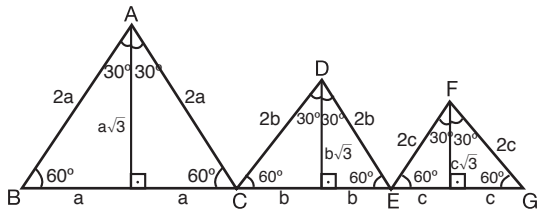
BFC üçgeninde [DE] = x orta tabandır.

$|DE| = \frac{|FC|}{2} = \frac{6}{2} = 3$ br'dir.

Cevap: C

ÖZEL ÜÇGENLER

9.



$a\sqrt{3} + b\sqrt{3} + c\sqrt{3} = 4\sqrt{3} \Rightarrow \sqrt{3}(a + b + c) = 4\sqrt{3}$

$a + b + c = 4$'tür.

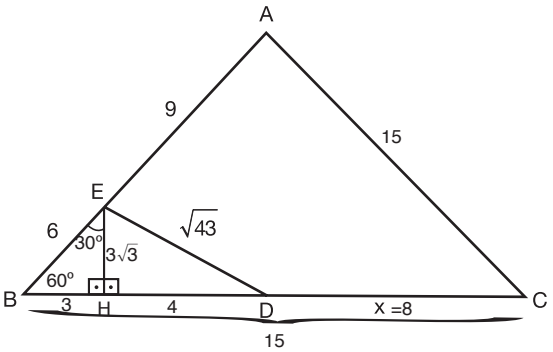
$Ç(ABC) + Ç(DCE) + Ç(FEG) = 6(a + b + c)$

$= 6 \cdot 4$

$= 24$ br'dir.

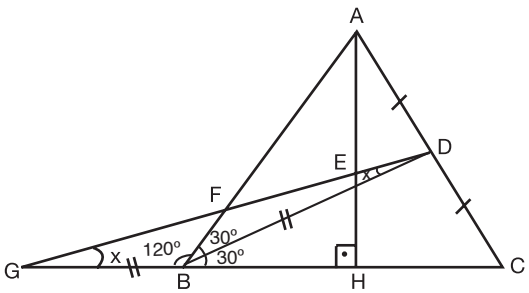
Cevap: D

11.



Cevap: A

10.

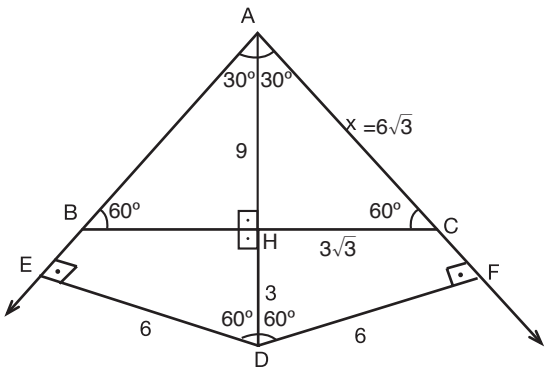


|AHI| = |BDI| = |GBI|'dir.

GBD üçgeninde $m(B) = 150^o \Rightarrow x = 15^o$ dir.

Cevap: D

12.



AED (30°, 60° 90°) üçgeninde

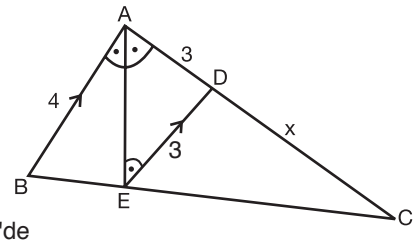
|ED| = 6 br ise |AD| = 12 br'dir. |AH| = 9 br'dir.AHC (30, 60, 90) üçgeninde

|AH| = 9 br ise |AC| = $x = 6\sqrt{3}$ br'dir.

Cevap: B

ÜÇGENDE BENZERLİK

1.

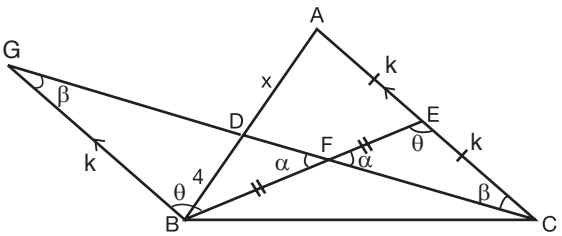


$\widehat{ABC}$'de

$\frac{|DE|}{|AB|} = \frac{|CD|}{|AC|}$, $\frac{3}{4} = \frac{x}{x+3} \Rightarrow x = 9$ br

Cevap: E

2.



GBD üçgeni FEC üçgenine eşittir. |GB| = k br

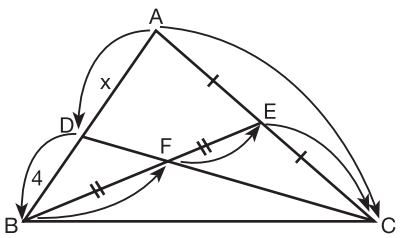
GBD ve CAD üçgenleri benzerdir.

$\frac{|GB|}{|AC|} = \frac{|BD|}{|AD|}$, $\frac{k}{2k} = \frac{4}{x} \Rightarrow x = 8$ br'dir.

Cevap: E

2. yol

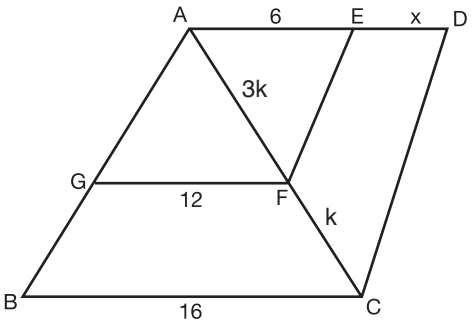
Menelaus Teoremi



$\frac{|EC|}{|AC|} \cdot \frac{|AD|}{|AB|} \cdot \frac{|BF|}{|FE|} = 1$

$\frac{1}{2} \cdot \frac{x}{4} \cdot \frac{1}{1} = 1$ x = 8 br

3.



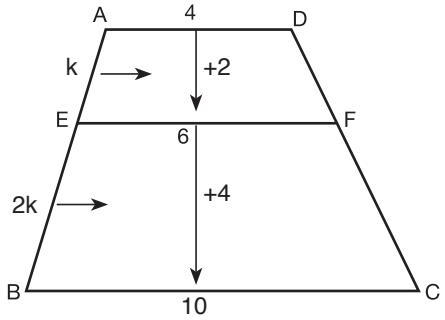
$\widehat{ABC}$'de $\frac{|GF|}{|BC|} = \frac{|AF|}{|AC|}$, $\frac{12}{16} = \frac{3}{4}$

|AF| = 3k dersek |AC| = 4k olur.

$\widehat{ACD}$'de $\frac{|AF|}{|FC|} = \frac{|AE|}{|ED|}$, $\frac{3k}{k} = \frac{6}{x} \Rightarrow x = 2$'dir.

Cevap: B

4.



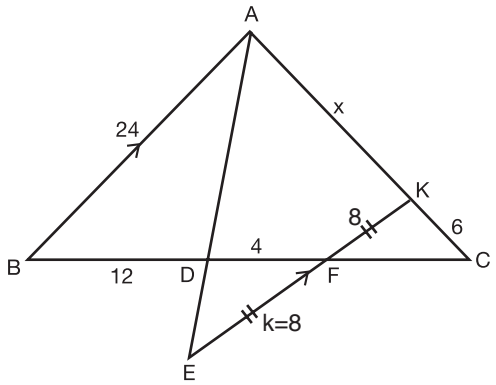
k da 2 br artarsa

2k'da 4 br artar |BC| = 10 br'dir.

Cevap: C

ÖZEL ÜÇGENLER

5.



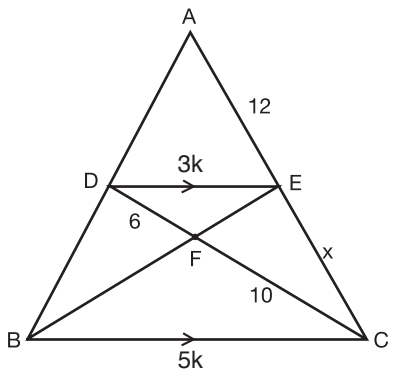
$\frac{|DF|}{|BD|} = \frac{|EF|}{|AB|}$, $\frac{4}{12} = \frac{k}{24} \Rightarrow k = 8$'dir.

$\widehat{ABC}$'de $\frac{|KC|}{|AC|} = \frac{|KF|}{|AB|}$, $\frac{8}{24} = \frac{6}{6+x}$

$\Rightarrow x = 12$ br'dir.

Cevap: A

6.



$\frac{|DF|}{|FC|} = \frac{|DE|}{|BC|} = \frac{6}{10}$ $|DE| = 3k$ dersek

$|BC| = 5k$ olur.

$\widehat{ABC}$'de $\frac{|DE|}{|BC|} = \frac{|AE|}{|AC|}$, $\frac{3k}{5k} = \frac{12}{12+x}$

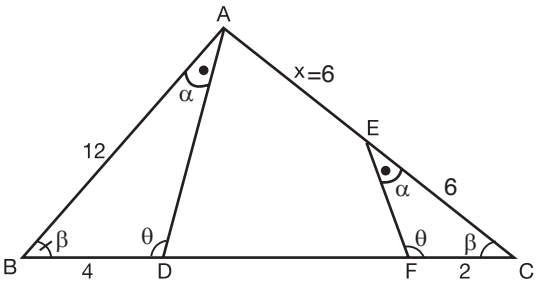
$\Rightarrow 36 + 3x = 60$

$3x = 24$

$x = 8$

Cevap: D

7.



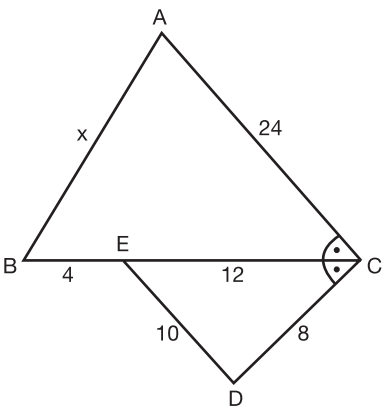
$\widehat{ABD} \approx \widehat{ECF}$'dir.

$\frac{|BD|}{|FC|} = \frac{|AB|}{|EC|}$, $\frac{4}{2} = \frac{12}{|EC|} \Rightarrow |EC| = 6$ br

$|AB| = |AC| = 12$ br olduğundan $x = 6$ br'dir.

Cevap: C

8.



$\widehat{CAB} \approx \widehat{CED}$ (K. A. K)

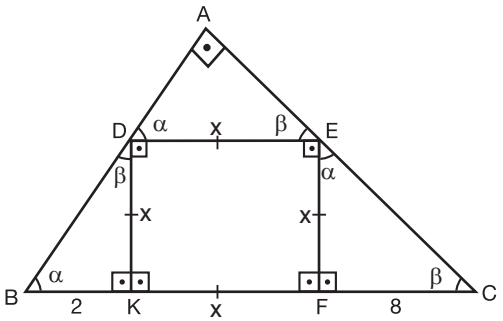
$\frac{|CA|}{|CE|} = \frac{|AB|}{|ED|} = \frac{|CB|}{|CD|} \Rightarrow \frac{24}{12} = \frac{x}{10} = \frac{16}{8}$

$x = 20$

Cevap: E

ÖZEL ÜÇGENLER

9.



$\widehat{KBD} \approx \widehat{FEC}$'dir.

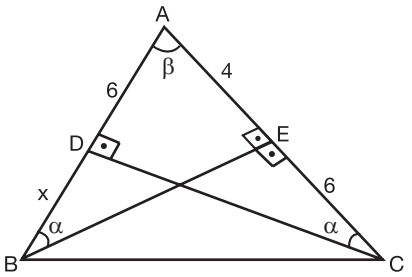
$$\frac{|BK|}{|EF|} = \frac{|DK|}{|FC|},\ \frac{2}{x} = \frac{x}{8} \Rightarrow x^2 = 16$$

$x = 4$ br'dir.

$A(DEFK) = x^2 = 16\,br^2$

Cevap: C

11.



$\widehat{EBA} \approx \widehat{DCA}$'dir.

$$\frac{|EA|}{|DA|} = \frac{|BA|}{|CA|},\ \frac{\cancel{4}^{2}}{\cancel{6}_{3}} = \frac{x+6}{10}$$

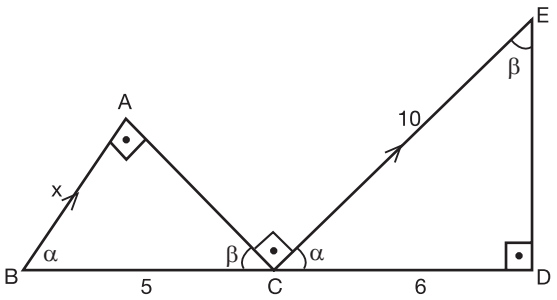
$$20 = 3x + 18$$

$$3x = 2$$

$$x = \frac{2}{3}$$

Cevap: A

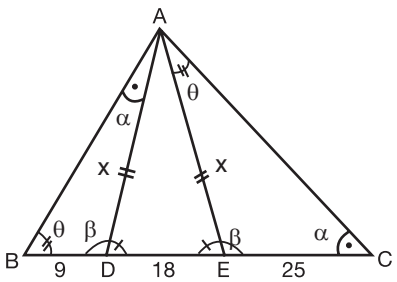
10.



$$\frac{|AB|}{|CD|} = \frac{|BC|}{|CE|},\ \frac{x}{6} = \frac{5}{10} \Rightarrow x = 3\,br$$

Cevap: D

12.



$\widehat{ADB} \approx \widehat{CEA}$

$$\frac{|BD|}{|EA|} = \frac{|AD|}{|CE|},\ \frac{9}{x} = \frac{x}{25} \Rightarrow x^2 = 9.25$$

$$x = 15$$

$$Ç(ADE) = 2x + 18$$

$$= 30 + 18$$

$$= 48\,br$$

Cevap: D

AÇI

1. $2.m(\widehat{A}) = 72° 84' 68'' = 71° 144' 68''$

$3.m(\widehat{B}) = 63° 99' 63'' = 63° 99' 63''$

$2m(\widehat{A}) - 3.m(\widehat{B}) = 8° 45' 05''$

Cevap: A

2. $x + (6y - x) = 90$

$6y = 90$

$y = 15°$

$y + (5y + 2x) = 180$

$6y + 2x = 180$

$6.15 + 2x = 180$

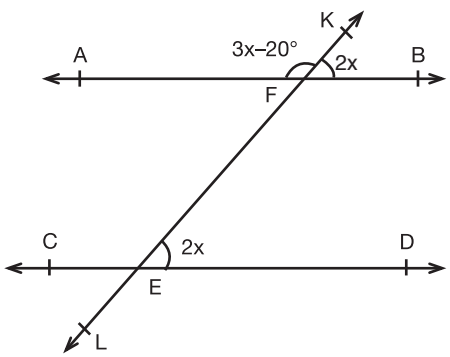
$2x = 90$

$x = 45°$

$x + y = 45 + 15 = 60°$

Cevap: C

3.



$m(\widehat{FED}) = m(\widehat{KFB})$ (Yöndeş açılar)

$m(\widehat{KFA}) + m(\widehat{KFB}) = 180°$ (Bütünler açılar)

$3x - 20 + 2x = 180$

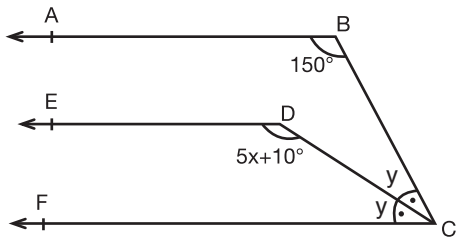
$5x = 200$

$x = 40°$

$m(\widehat{KFB}) = 2x = 2.40 = 80$

Cevap: E

4.



$m(\widehat{ABC}) + m(\widehat{BCF}) = 180$ (Karşı durumlu açılar)

$150 + 2y = 180$

$y = 15$

$m(\widehat{EDC}) + m(\widehat{DCF}) = 180°$ (Karşı durumlu açılar)

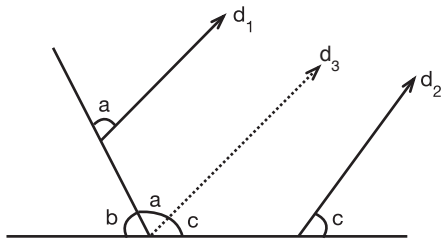
$5x + 10 + 15 = 180$

$5x = 155$

$x = 31°$

Cevap: C

5.

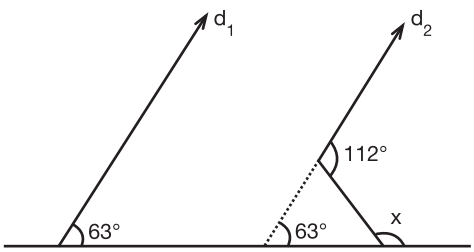


$a + c = 150$

$a + b + c = 180°$ $\quad a + c = 150° \Rightarrow b = 30°$

Cevap: C

6.



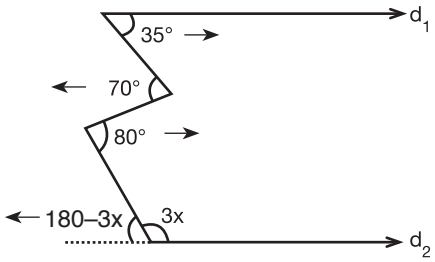
$x = ?$

$x = 68 + 63 = 131°$

Cevap: D

AÇI

7.

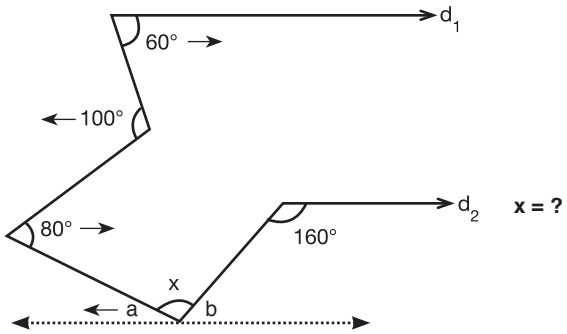


x = ?

35 + 80 = 70 + (180 – 3x)
115 = 250 – 3x
3x = 135
x = 45°

Cevap: D

9.



x = ?

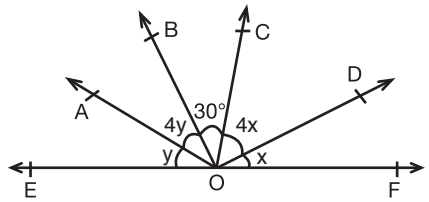
60 + 80 = 100 + a
a = 40°

160 + b = 180°
b = 20°

x + a + b = 180
x + 40 + 20 = 180 ⇒ x = 120°

Cevap: B

8.



$4m(\widehat{FOD}) = m(\widehat{COD})$
$4m(\widehat{EOA}) = m(\widehat{AOB})$

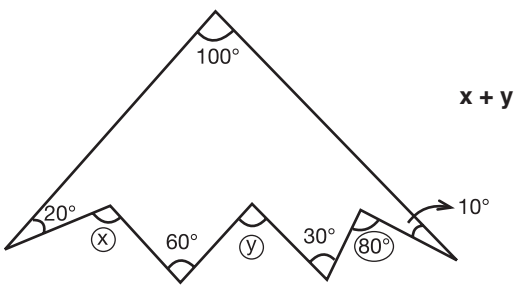
$5y + 30 + 5x = 180$
$5(x + y) = 150$
$x + y = 30$

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

$m(\widehat{AOD}) = 4x + 4y + 30$
$= 4(x + y) + 30$
$= 4.30 + 30$
$= 150$

Cevap: D

10.



x + y = ?

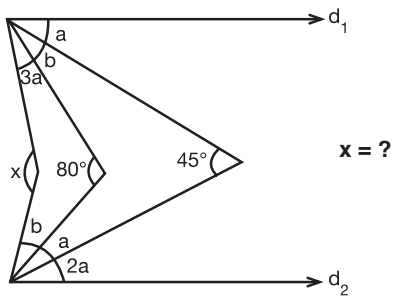
Kural: Şeklin içindeki açıların toplamı, dışındaki açıların toplamına eşittir.

100 + 20 + 60 + 30 + 10 = x + y + 80
x + y = 140°

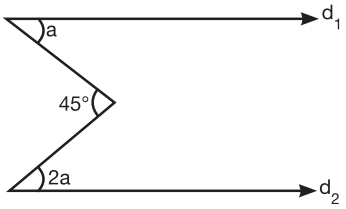
Cevap: A

AÇI

11.



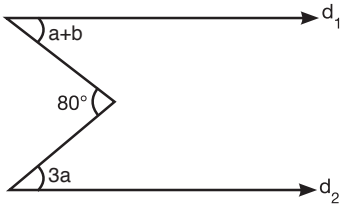
x = ?



$a + 2a = 45$

$3a = 45$

$a = 15°$

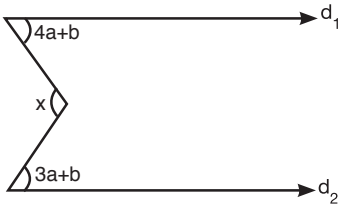


$a + b + 3a = 80$

$4a + b = 80$

$4.15 + b = 80$

$b = 20°$



$x = 4a + b + 3a + b$

$x = 7a + 2b$

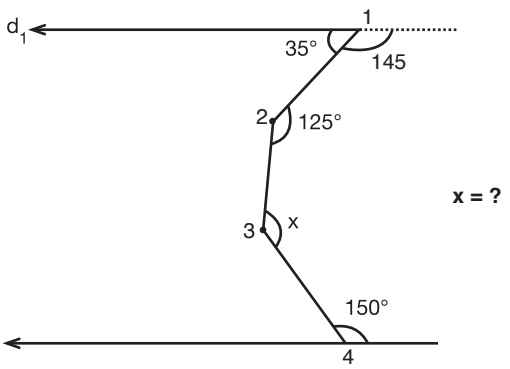
$x = 7.15 + 2.20$

$x = 105 + 40$

$x = 145°$

Cevap: B

12.



x = ?

KURAL: İki paralel doğru arasında kalan ve aynı yöne bakan açıların toplamı:
(Kırık nokta sayısı – 1).180

Kırık nokta sayısı = 4

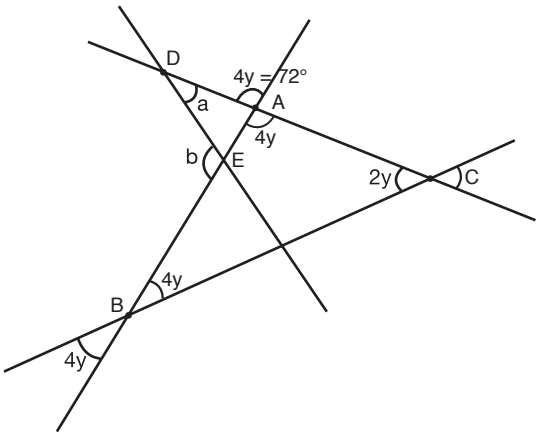
$x + 145 + 125 + 150 = (4–1).180$

$x = 120$

Cevap: C

AÇI – ÜÇGENDE AÇI

1.



ABC üçgeninin iç açıları toplamı 180° olduğundan

$4y + 4y + 2y = 180 \Rightarrow y = 18$

$4y = 72$

ADE üçgeninde iki iç açının toplamı kendilerine komşu olmayan bir dış açıya eşit olacağından,

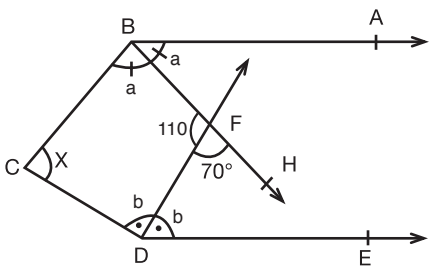
$a + 108 = b \Rightarrow b - a = 108°$ dir.

$$\begin{array}{rl} & b + a = 132 \\ + & b - a = 108 \\ \hline & 2b = 240 \end{array}$$

$b = 120$, $a = 12°$ dir.

Cevap: A

2.



$2a + x + 2b = 360$ ve $a + b + x + 110 = 360$

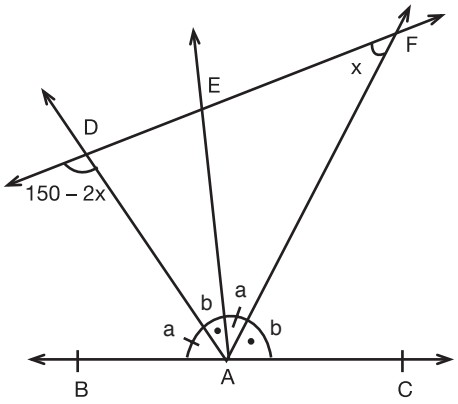
(–1 ile çarp) $a + b + x = 250°$

(2 ile genişlet)

$$\begin{array}{rl} & 2a + 2b + 2x = 500 \\ + & -2a - 2b - x = -360 \\ \hline & x = 140 \end{array}$$

Cevap: E

3.



$2a + 2b = 180 \Rightarrow a + b = 90°$ dir.

$m(\widehat{DAF}) = 90°$

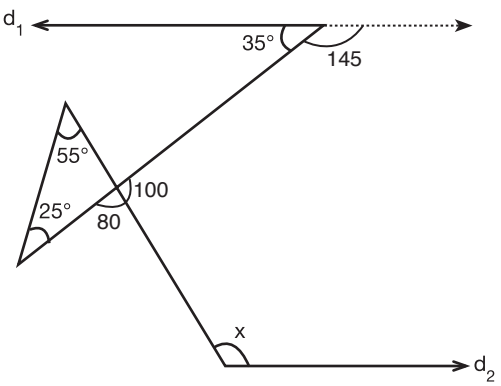
$x + 90 = 150 - 2x \quad (\widehat{DAF})$

$3x = 60$

$x = 20°$

Cevap: C

4.

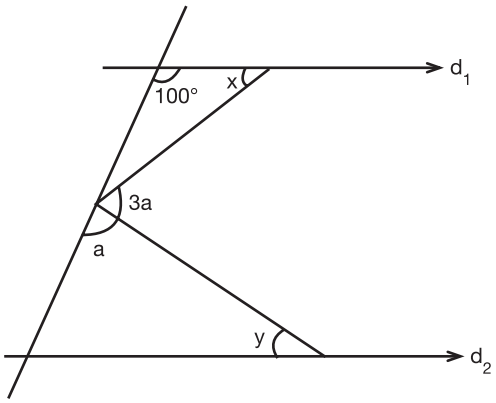


$145 + 100 + x = 360 \Rightarrow x = 115°$

Cevap: C

AÇI – ÜÇGENDE AÇI

5.



3 / $x + 100 = 4a \Rightarrow 3x + 300 = 12a$

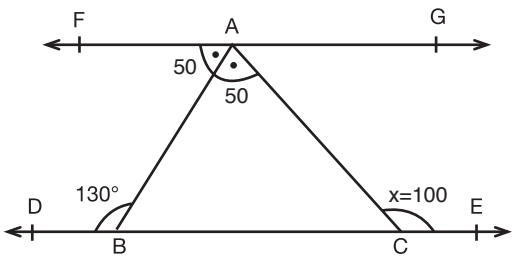
4 / $x + y = 3a \Rightarrow 4x + 4y = 12a$

$3x + 300 = 4x + 4y$

$x + 4y = 300$

Cevap: D

6.

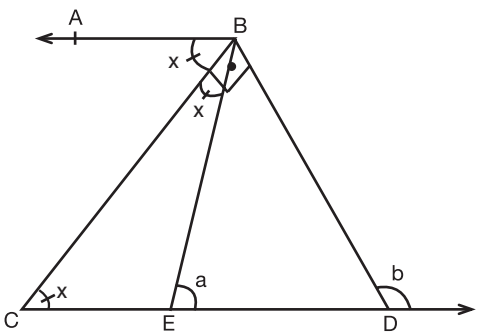


$m(\widehat{FAB}) = 50$ (Karşı durumlu açılar)

$m(\widehat{FAC}) = m(\widehat{ACE})$ (İç ters açılar)

Cevap: B

7.



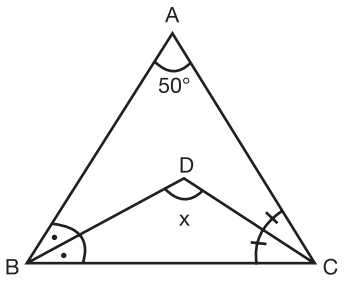
$b = 90 + x$ $\quad a = 2x$

$x = b - 90$ $\quad a = 2(b - 90)$

$a = 2b - 180$

Cevap: A

8.



I. yol:

$x = 90 + \frac{m(\widehat{A})}{2} \Rightarrow x = 90 + \frac{50}{2}$

$x = 115°$

II. yol:

$50 + 2a + 2b = 180$

$2a + 2b = 130$

$2(a + b) = 130$

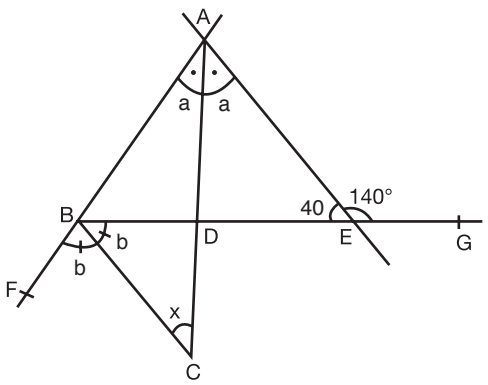
$a + b = 65$

$x + \underbrace{a + b}_{65} = 180°$

$x = 115°$

Cevap: C

9.



I. yol:

$x = \frac{m(\widehat{AEB})}{2} = \frac{40}{2} = 20°$

II. yol:

$2a + 40 = 2b \Rightarrow 2b - 2a = 40$ $(\widehat{AEB})$

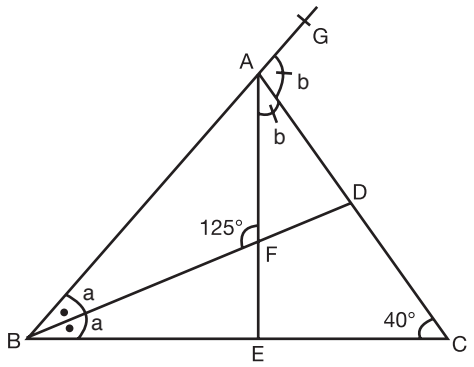
$b - a = 20$

$a + x = b \Rightarrow x = b - a = 20°$ $(\widehat{ABC})$

Cevap: B

AÇI – ÜÇGENDE AÇI

10.



• $2a + 40 = b \quad (\widehat{ABC})$

• $a + b + 40 = 125$

$a + b = 85$

$b = 85 - a$

$\Rightarrow 2a + 40 = 85 - a$

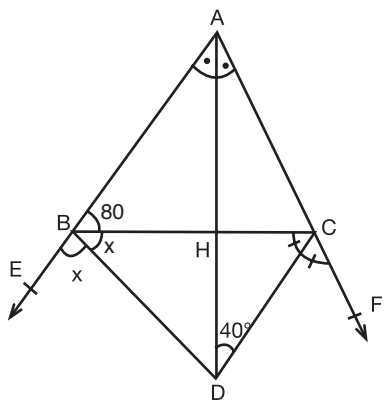
$3a = 45$

$a = 15$

$m(\widehat{ABC}) = 2a = 30°$

Cevap: E

11.



Kural:

[AD] ve [CD] açıortay ise [BD]'de açıortaydır.

$m(\widehat{ADC}) = \frac{m(\widehat{ABC})}{2} \Rightarrow 40 = \frac{m(\widehat{ABC})}{2}$

$\Rightarrow m(\widehat{ABC}) = 80°$

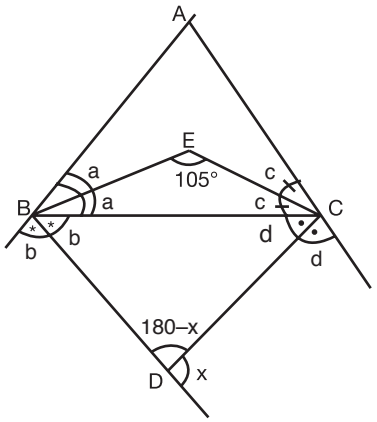
$2x + 80 = 180°$

$2x = 100°$

$x = 50°$

Cevap: C

12.



$2a + 2b = 180$

$a + b = 90$

$2c + 2d = 180$

$c + d = 90$

EBCD dörtgeninin iç açıları toplamı 360° dir.

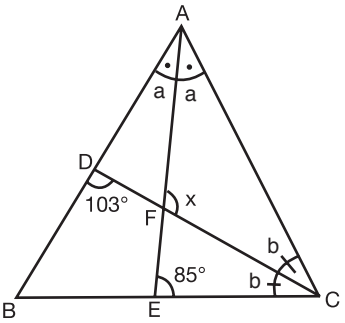
$105 + 90 + 90 + 180 - x = 360$

$x = 105°$

Cevap: A

ÜÇGENDE AÇI

1.



$2a + b = 103$ ($\widehat{ADC}$)

$a + 2b + 85 = 180$ ($\widehat{AEC}$) $\Rightarrow a + 2b = 95$

$2a + b = 103$

$+ \quad a + 2b = 95$

$3a + 3b = 198 \Rightarrow 3(a + b) = 198$ olur.

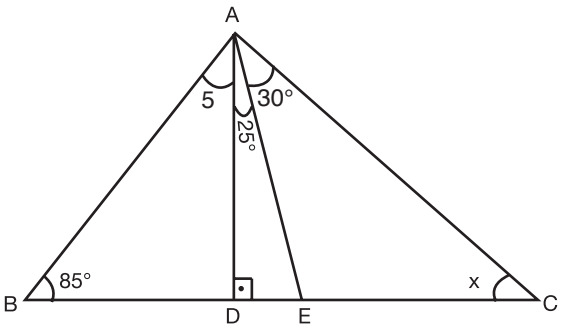
$a + b = 66$

$\underbrace{a + b}_{66} + x = 180$ ($\widehat{AFC}$)

$x = 114°$

Cevap: D

3.



I. yol:

$m(\widehat{BAE}) = m(\widehat{EAC}) = 30°$

$x + 55 + 90 = 180$

$x = 35°$

II. yol:

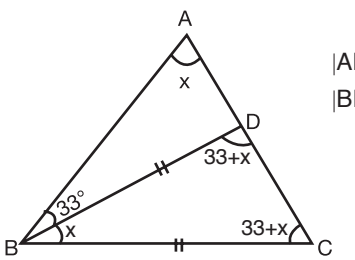
$m(\widehat{DAE}) = \dfrac{|m(\widehat{B}) - m(\widehat{C})|}{2}$

$25 = \dfrac{|85 - x|}{2}$

$x = 35$

Cevap: B

2.



$|AB| = |AC|$

$|BD| = |BC|$

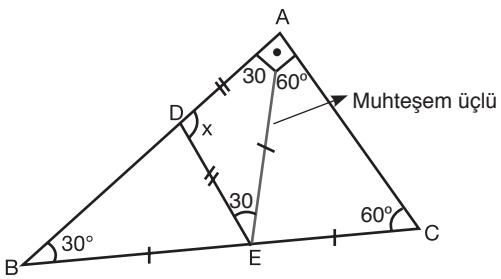
$x + (33 + x) + (33 + x) = 180°$

$3x = 114$

$x = 38°$

Cevap: A

4.

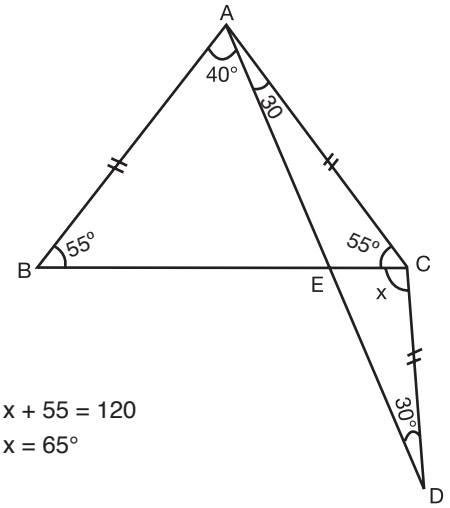


$x = 120°$

Cevap: D

ÜÇGENDE AÇI

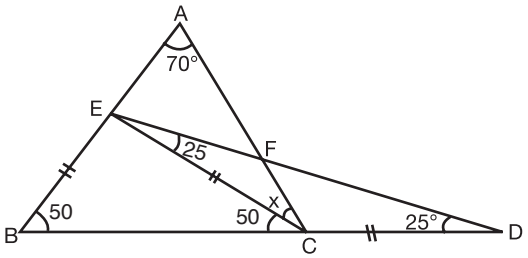
5.



x + 55 = 120
x = 65°

Cevap: A

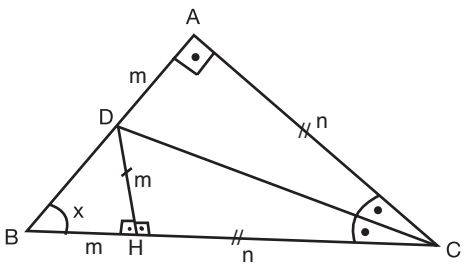
6.



70 + 50 + 50 + x = 180 $\Rightarrow$ x = 10°

Cevap: B

7.



|BC| = |AD| + |AC|

m + n = m + n

Kural

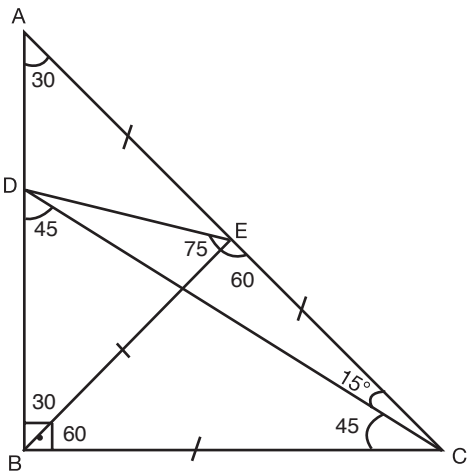
Açıortay üzerinden kollara indirilen dikmelerin uzunlukları ve açıortay kollarının uzunlukları birbirine eşittir.

m = |AD| = |DH| ve n = |AC| = |HC| dir.

Dolayısıyla |BH| = m dir. Yani BDH üçgeni ikizkenar dik üçgendir. x = 45°

Cevap: D

8.



$\widehat{DBC}$ ikizkenar dik üçgen |DB| = |BC|

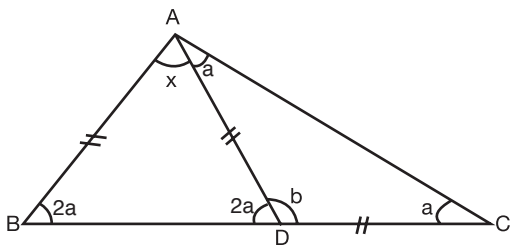
$\widehat{DBE}$ ikizkenar üçgen |DB| = |BE|

$m(\widehat{DBE}) = 30 \Rightarrow m(\widehat{DBE}) = m(\widehat{DEB}) = 75^o$

$x = 60^o + 75^o = 135^o$

Cevap: E

9.



$\cancel{2a}$ + b = 180

\+ b – $\cancel{2a}$ = 48

2b = 228

b = 114 ve a = 33

4a + x = 180

4.33 + x = 180

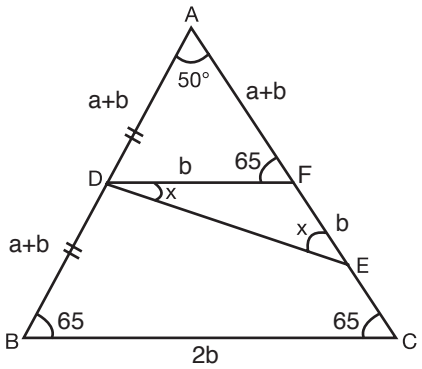
x = 180 – 132

x = 48°

Cevap: D

ÜÇGENDE AÇI

10.



$|AB| = |AC| = 2a + 2b$

$|EC| + |BC| = |AE|$

a 2b a+2b

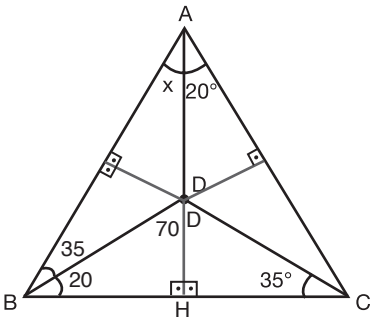
[DF] orta taban

$|DF| = \frac{|BC|}{2} = b$

$2x = 65 \Rightarrow x = 32{,}5°$

Cevap: B

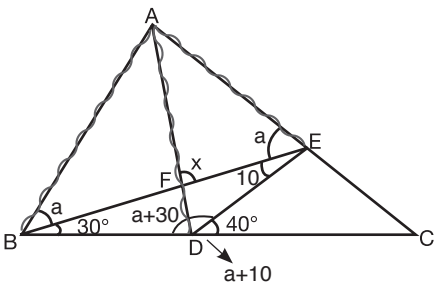
12.



$x = 35°$ $(\widehat{ABH})$

Cevap: A

11.



$(a + 30) + (a + 10) + 40 = 180$

$2a + 80 = 180$

$2a = 100$

$a = 50$

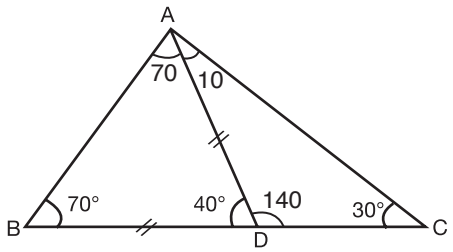
$x = a + 10 + 10$

$x = 70°$

Cevap: E

AÇI - KENAR BAĞINTILARI

1.



$\widehat{ABD}$ için $|AD| = |BD| > |AB|$

$\widehat{ADC}$ için $|AC| > |AD| > |DC|$

$\widehat{ABC}$ için $|BC| > |AC| > |AB|$

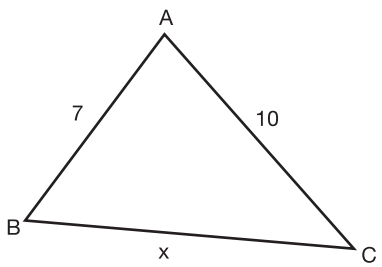
Sonuç olarak;

$|BC| > |AC| > |AD| = |BD| > |AB|$ ve

$|AD| > |DC|$ dir. $|DC| > |AD|$ ifadesi yanlıştır.

Cevap: C

2.



Genel kurala göre $3 < x < 17$

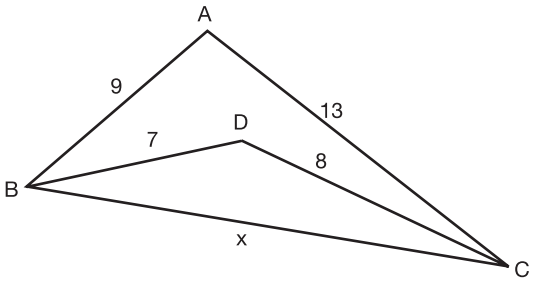
$m(\hat{B}) < m(\hat{A})$ için $10 < x$

Sonuç olarak $10 < x < 17$ olmalıdır.

x'in alabileceği 6 farklı değer vardır.

Cevap: B

3.



$\widehat{ABC}$ iken $|13 - 9| < x < |13 + 9|$

$4 < x < 22$

$\widehat{BDC}$ iken $|8 - 7| < x < |18 + 7|$

$1 < x < 15$

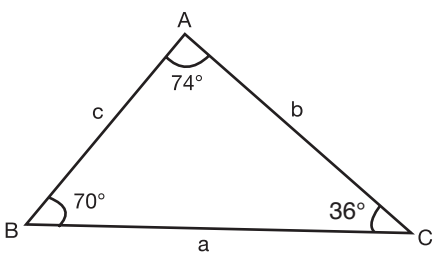
Sonuç olarak

$4 < x < 15$ olmalıdır. (En dar aralık seçilir.)

x'in alabileceği 10 farklı değer vardır.

Cevap: A

4.



$c < b < a'$ dır.

$|a - b| - |b - c| - |c - a|$

$\downarrow \quad \downarrow \quad \downarrow$

$b < a \quad c < b \quad c < a$

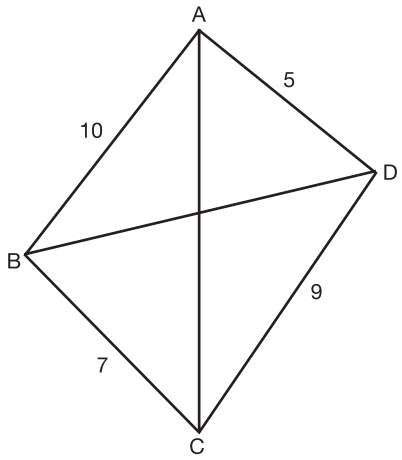
$(a - b) - (b - c) - (a - c) = \cancel{a} - b - b + c - \cancel{a} + c$

$= 2c - 2b$

Cevap: E

AÇI - KENAR BAĞINTILARI

5.



$\widehat{ABD}$ için $5 < |BD| < 15$

$\widehat{BCD}$ için $2 < |BD| < 16$

Sonuç olarak $5 < |BD| < 15$ olmalıdır.

$\widehat{ABC}$ için $3 < |AC| < 17$

$\widehat{ADC}$ için $4 < |AC| < 14$

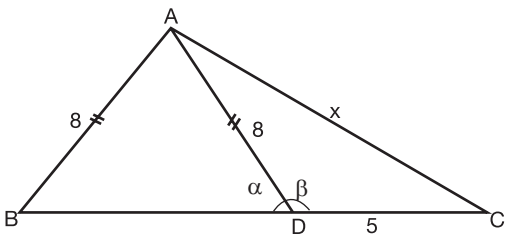
Sonuç olarak $4 < |AC| < 14$ olmalıdır.

$$\begin{array}{rl} & 5 < |BD| < 15 \\ + & 4 < |AC| < 14 \\ \hline & 9 < |BD| + |AC| < 29 \end{array}$$

$|BD| + |AC|$ 'nin abileceği en büyük değer 28 dir.

Cevap: C

6.



$\alpha < 90^o$ olmalıdır. Dolayısıyla $\beta > 90^o$ dir. Yani $\widehat{ADC}$'ni geniş açılı üçgendir.

$89^2 + 5^2 < x^2$ ve $3 < x < 13$

$89 < x^2$

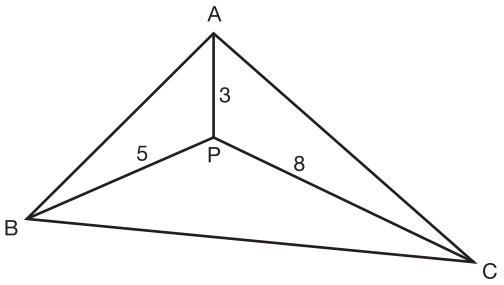
$\sqrt{89} < x$

Sonuç olarak $\sqrt{89} < x < 13$ tür.

x'in alabileceği en küçük değer 10'dur.

Cevap: B

7.



Kural

$|AP|+|BP|+|CP| < Ç(ABC) < 2.(|AP|+|BP|+|CP|)$

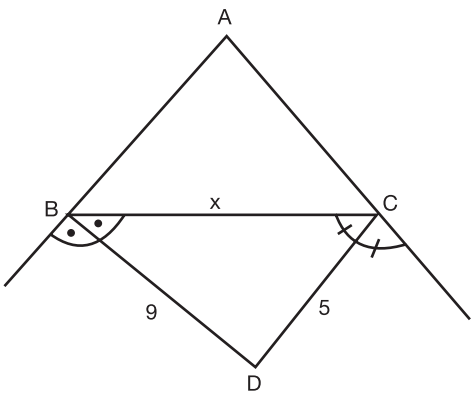
$3 + 5 + 8 < Ç(ABC) < 2.(3 + 5 + 8)$

$16 < Ç(ABC) < 32$ olmalıdır.

$Ç(ABC) = 33$ olamaz.

Cevap: E

8.



$m(\widehat{D}) = 90 - \frac{m(\widehat{A})}{2}$ 'dir. Yani $\widehat{D}$ dar açıdır.

Buna göre

$x^2 < 9^2 + 5^2$ ve $4 < x < 13$

$x^2 < 106$

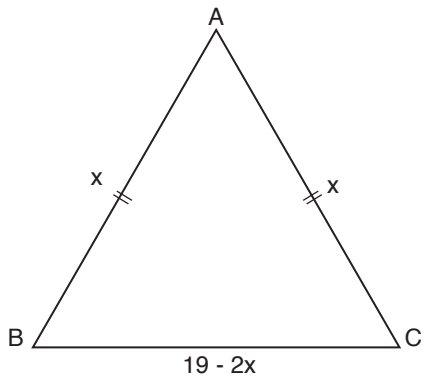
$x < \sqrt{106}$

Sonuç olarak $4 < x < \sqrt{106}$ $(\sqrt{106} = 10, ...)$

x'in alabileceği tamsayı değerleri 5, 6, 7, 8, 9, 10'dur.

Cevap: B

9.



$|19 - 2x - x| < x < |19 - 2x + x|$

$\underbrace{|19 - 3x| < x}_{I} < \underbrace{|19 - x|}_{II.}$

I. için $19 - 3x < x$ II. için $x < 19 - x$

$19 < 4x$ $2x < 19$

$\frac{19}{4} < x$ $x < \frac{19}{2}$

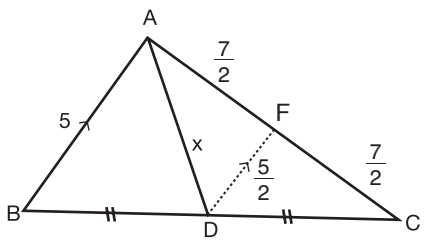
Sonuç olarak $\frac{19}{4} < x < \frac{19}{2}$

$4. ... < x < 9.5 ...$

x'in alabileceği tamsayı değerleri 5, 6, 7, 8, 9 dur.

Cevap: E

10.



[DF] // [AB] çizilir. (Orta taban)

$|AF| = |FC| = \frac{7}{2}$

$|DF| = \frac{|AB|}{2} = \frac{5}{2}$ dir.

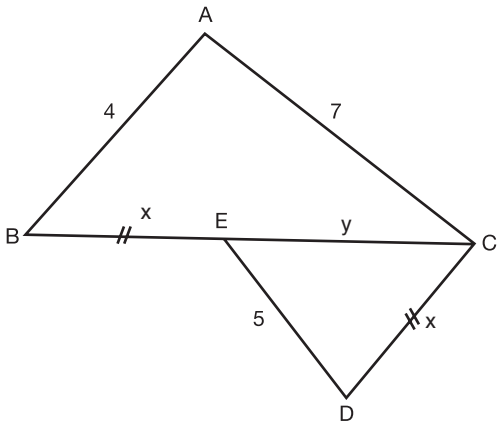
$\widehat{ADF}$ için $\left|\frac{7}{2} - \frac{5}{2}\right| < x < \left|\frac{7}{2} + \frac{5}{2}\right|$

x'in alabileceği tamsayı değerleri 2, 3, 4, 5 tir.

2 + 3 + 4 + 5 = 14 tür.

Cevap: C

11.



$\widehat{ABC}$ için $|7 - 4| < |BC| < |7 + 4|$

$3 < |BC| < 11$ dir.

$3 < x + y < 11$

$\widehat{EDC}$ için $|x - y| < 5 < |x + y|$

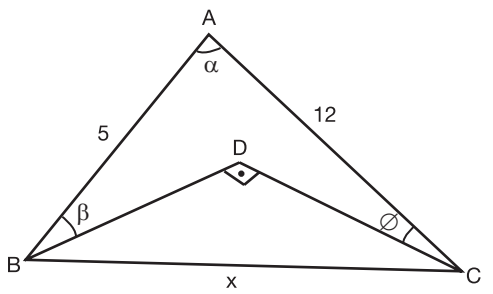
Sonuç olarak $5 < x + y < 11$ olmalıdır.

$5 < |BC| < 11$

|BC| 'nin alabileceği 5 farklı değer vardır.

Cevap: A

12.



$\alpha + \beta + \varnothing = 90$ olduğundan $\alpha < 90$ dır diyebiliriz.

Yani $\widehat{ABC}$ üçgeni dar açılı üçgendir.

$x^2 < 5^2 + 12^2$ ve $|12 - 5| < x < |12 + 5|$

$x^2 < 169$ $7 < x < 17$

$x < \sqrt{169}$

$x < 13$

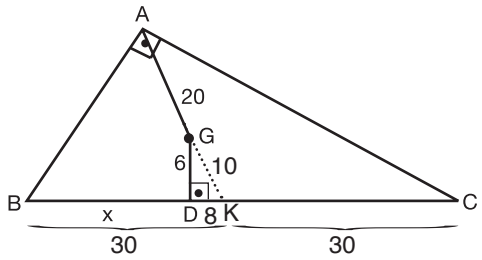
Sonuç olarak

$7 < x < 13$ olmalıdır. x'in alabileceği en büyük tamsayı değeri 12'dir.

Cevap: E

KENARORTAY

1.



|AG| = 2 |GK| ⇒ |GK| = 10 br

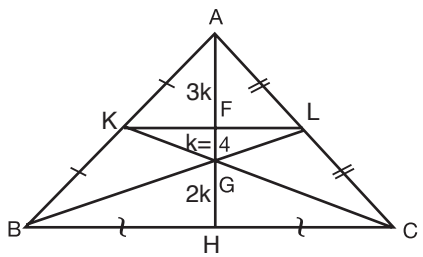
$\widehat{GDK}$ üçgeninde |DK| = 8 br (6, 8, 10 üçgeni)

m($\hat{A}$) = 90 ⇒ |AK| = |BK| = |KC| = 30 br (Muhteşem üçlü)

x = 22 br'dir.

Cevap: E

2.



k = 4 ise 6k = 24'tür.

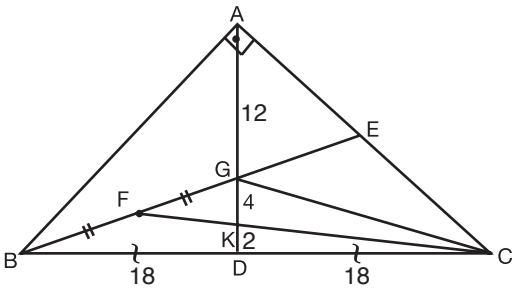
Not: • [KL] orta tabandır. Yani |AF| = |FH|

• G ağırlık merkezidir. Yani 2 |GH| = |AG|'dir.

Bu iki eşitliği sağlayan oran (3k, k, 2k)

Cevap: C

3.



BGC üçgeninde [GD] ve [FC] kenarortay olduğundan K noktası bu üçgenin ağırlık merkezidir.

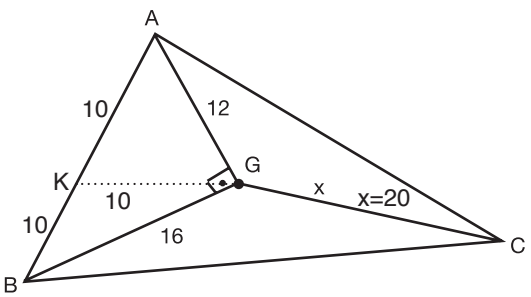
2 |KD| = |GK| ⇒ |KD| = 2 br

2 |GD| = |AG| ⇒ |AG| = 12 br

m($\hat{A}$) = 90° ve |AD| = 18 br ⇒ |BC| = 36 br (Muhteşem üçlü)

Cevap: E

4.



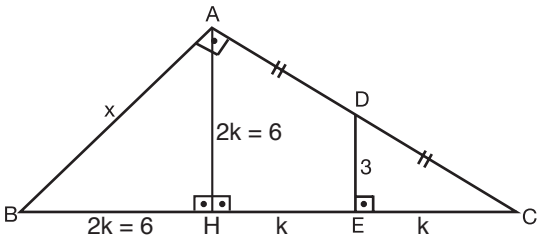
$\widehat{ABD}$ için |AB| = 20 br (12, 16, 20 üçgeni) |KG| = 10 br (Muhteşem üçlü)

x = |GC| = 2 |KG| = 20 br

Cevap: D

KENARORTAY

5.



4 |EC| = |BC|

|EC| = k dersek |BC| = 4k olur.

[AH] dikmesini indirirsek |HE| = |EC| = k olur.

Dolayısıyla |BH| = 2k olur. ($\widehat{AHC}$)

$\widehat{ABC}$'de m($\hat{A}$) = 90° ve |BH| = |HC| olduğundan

|AH| = 2k olur. (Muhteşem üçlü)

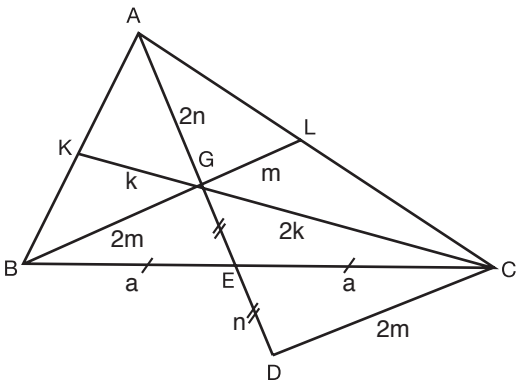
$\widehat{AHC}$'de |AH| = 2 |DE| olduğundan |AH| = 6 br

$\widehat{ABH}$ üçgeni ikizkenar dik üçgendir.

$x = 6\sqrt{2}$ br'dir.

Cevap: C

6.



|AE| + |BL| + |KC| = 36 br

|GE| = |ED|

3k + 3m + 3n = 36

3(k + m + n) = 36

k + m + n = 12 br

$\widehat{EBG}$ ve $\widehat{ECD}$ üçgenleri eş üçgenleri
(Kenar - Açı - Kenar)

Dolayısıyla |DC| = 2m br'dir.

Ç(GDC) = 2k + 2m + 2n

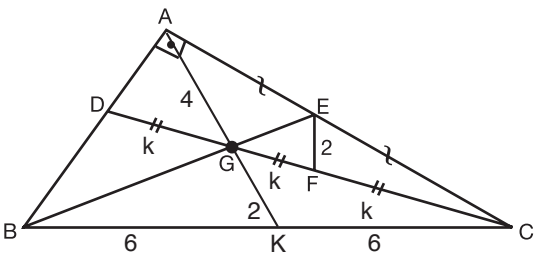
= 2(k + m + n)

= 2 . 12

= 24 br'dir.

Cevap: A

7.



|DG| = |FC| = k dersek

2. |DG| = |GC| olduğundan |GF| = k olur.

AGC üçgeninde [EF] orta taban olduğundan |AD| = 4 br'dir.

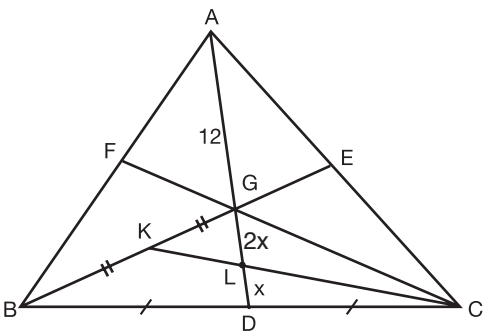
|GK| = 2 br ve |AK| = 6 br olur.

|BC| = 2 |AK| (Muhteşem üçlü)

|BC| = 2 . 6 = 12 br

Cevap: C

8.



BGC üçgeninde [KC] ve [GD] kenarortay olduğundan L noktası bu üçgenin ağırlık noktasıdır.

|LD| = x ⇒ |GL| = 2x'tir.

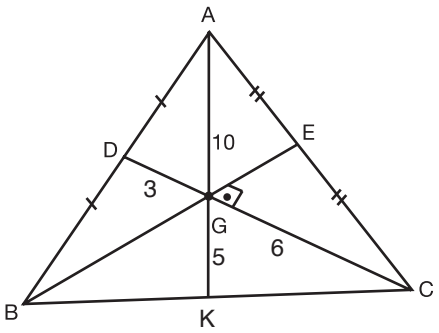
ABC üçgeninde |AG| = 12 , |GD| = 3x = 6 br

⇒ x = 2 br'dir.

Cevap: B

KENARORTAY

9.



$V_b \perp V_c$ olduğundan $V_a^2 = V_b^2 + V_c^2$'dir.

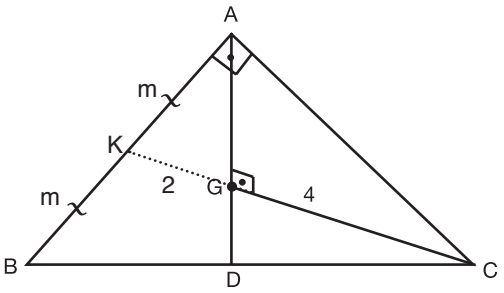
$V_a = 15$ br $\quad V_c = 9$ br $\quad V_b = ?$

$15^2 = 9^2 + V_b^2$

$V_b^2 = 144 \Rightarrow V_b = |BE| = 12$ br'dir.

Cevap: C

11.



AKC üçgeninde öklid teoremi uygularsak

$m^2 = 2\,(2 + 4) = 12$

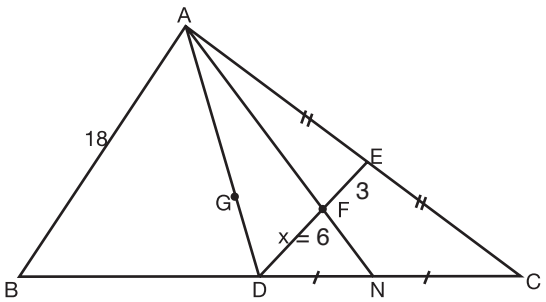
$m^2 = 12$

$m = 2\sqrt{3} \qquad x = 2m = 2 \cdot 2\sqrt{3}$

$x = 4\sqrt{3}$

Cevap: B

10.



ADC üçgeninde F noktası ağırlık merkezidir.

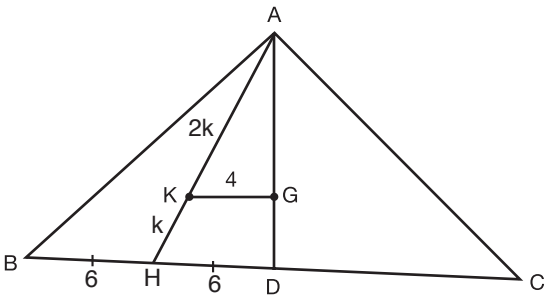
ABC üçgeninde [DE] orta tabandır.

$|DE| = \dfrac{|AB|}{2} = 9$ br'dir. $\qquad |FE| = 3$ br

$|DF| = X = 6$ br'dir.

Cevap: E

12.



AHD üçgeninde benzerlik uygularsak

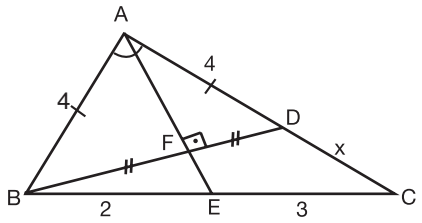
$\dfrac{|AK|}{|AH|} = \dfrac{2k}{3k} = \dfrac{|KG|}{|HD|} \Rightarrow |HD| = 6$ br

$|BD| = |DC| = 12$ br $\Rightarrow |BC| = 24$ br'dir.

Cevap: D

AÇIORTAY

1.



ABC üçgeninde

[AF] yükseklik ve kenarortay ise aynı zamanda açıortaydır ve

ABD üçgeni ikizkenar üçgendir.

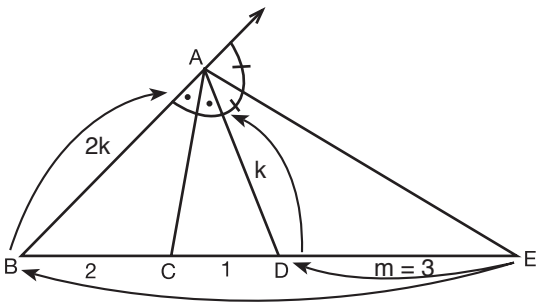
$|ABI = |ADI = 4$ br

ABC üçgeninde iç açıortay teoremine göre

$\frac{|AB|}{|BE|} = \frac{|AC|}{|EC|}$'dir. $\quad \frac{4}{2} = \frac{4+x}{3} \Rightarrow x = 2$ br

Cevap: D

2.



ABC üçgeninde iç açıortay teoremine göre

$\frac{|AB|}{|AD|} = \frac{|BC|}{|CD|} = \frac{2}{1}$ $\quad |AB| = 2k$ dersek

$|AD| = k$ olur.

ABD üçgeninde dış açıortay teoremine göre

$\frac{|DE|}{|BE|} = \frac{|AD|}{|AB|} = \frac{1}{2}$ $\quad |DE| = m$ dersek

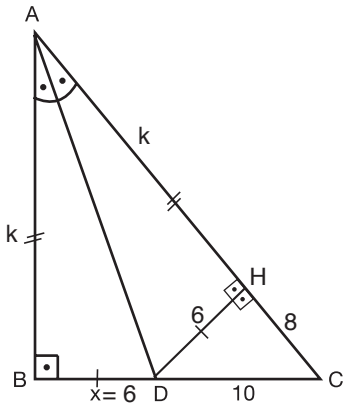
$|BE| = 2m$ olur.

$2m = 3 + m \Rightarrow m = 3$'tür.

$\frac{|BC|}{|BE|} = \frac{2}{6} = \frac{1}{3}$

Cevap: C

3.



$|AB| = k$ dersek $|AE| = k + 8$ olur.

Açıortay üzerindeki aynı noktadan kollara indirilen dikmeler kolları aynı oranda böler ve uzunlukları eşittir. Dolayısıyla

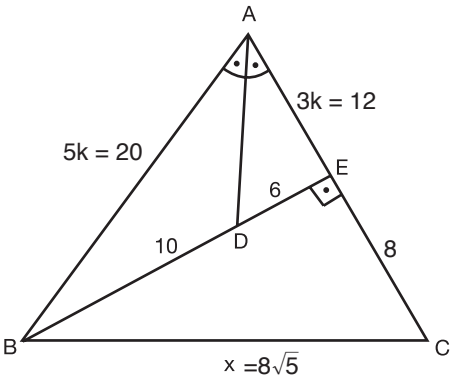
$|AB| = |AH| = k$ ve $|BD| = |DH| = x$'tir.

$|HC| = 8$ ve DHC dik üçgeninde (6, 8, 10)

$|DH| = x = 6$ br'dir.

Cevap: C

4.



ABD üçgenin iç açıortay teoremine göre

$\frac{|AB|}{|AE|} = \frac{|BD|}{|DE|} = \frac{10}{6}$'dır. $\quad |AB| = 5k$ dersek

$|AE| = 3k$ olur.

ABD dik üçgeni (12, 16, 20) üçgenidir.

$|AB| = |AC|$ olduğundan $|EC| = 8$ br'dir.

EBC dik üçgeninde pisagor uygulanırsa

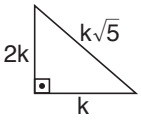
$|EB|^2 + |EC|^2 = |BC|^2$

$16^2 + 8^2 = x^2$

$x = 8\sqrt{5}$

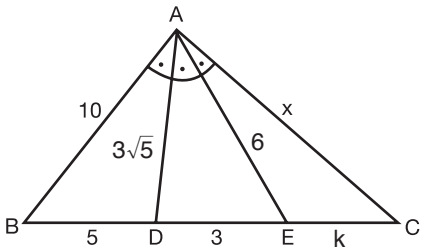
Cevap: D

Not:



AÇIORTAY

5.



ABE üçgeninde iç açıortay teoremine göre

$|AE| = 6$ br'dir.

ABE üçgeninde iç açıortay uzunluk teoremine göre

$|AD|^2 = |AB| \cdot |AE| - |BD| \cdot |DE|$

$|AD|^2 = 10 \cdot 6 - 5 \cdot 3 = 45$

$|AD| = 3\sqrt{5}$

ADC üçgeninde $\frac{|AD|}{|DE|} = \frac{|AC|}{|EC|} = \frac{3\sqrt{5}}{3} = \sqrt{5}$'tir.

$|AC| = k\sqrt{5}$ dersek $|EC| = k$ olur.

ADC üçgeninde iç açıortay uzunluk teoremine göre

$|AE|^2 = |AD| \cdot |AC| - |DE| \cdot |EC|$

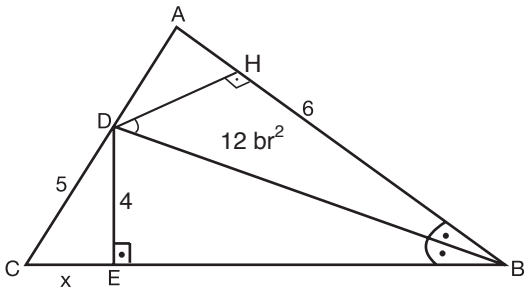
$6^2 = 3\sqrt{5} \cdot k\sqrt{5} - 3 \cdot k$

$36 = 12k$

$k = 3$ $\quad x = k\sqrt{5} = 3\sqrt{5}$ ' tir.

Cevap: C

6.



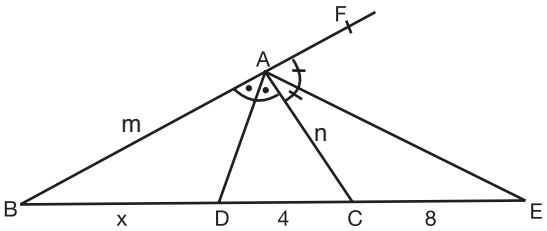
$A(ABD) = 12$ br^2 $\Rightarrow \frac{|DH| \cdot 6}{2} = 12$ ve $|DH| = 4$ br

$|DH| = |DE|$ olduğundan $|DE| = 4$ br'dir.

DEC üçgeni (3, 4, 5) üçgenidir. $x = 3$ br'dir.

Cevap: C

7.



ABC üçgenin iç açıortay teoremine göre

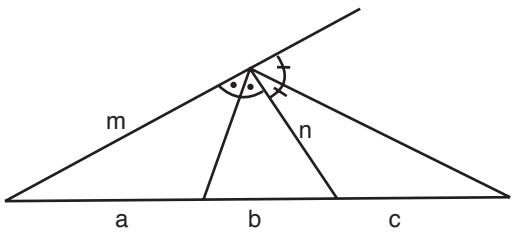
$\frac{m}{n} = \frac{x}{4}$

Dış açıortay teoremine göre $\frac{m}{n} = \frac{x+12}{8}$'dir.

$\frac{x}{4} = \frac{x+12}{8} \Rightarrow x = 12$ br'dir.

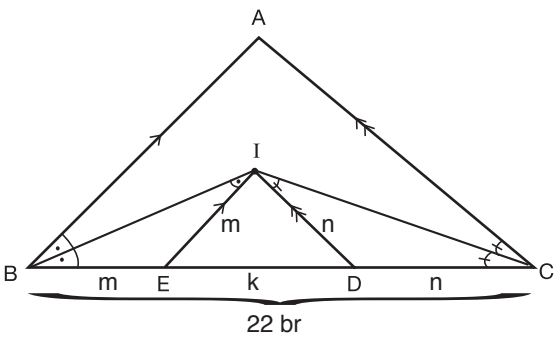
Cevap: D

Not:



$\frac{a-b}{a+b} = \frac{b}{c}$'dir. $\left(\frac{x-4}{x+4} = \frac{4}{8},\ x = 12\,\text{br}\right)$

8.

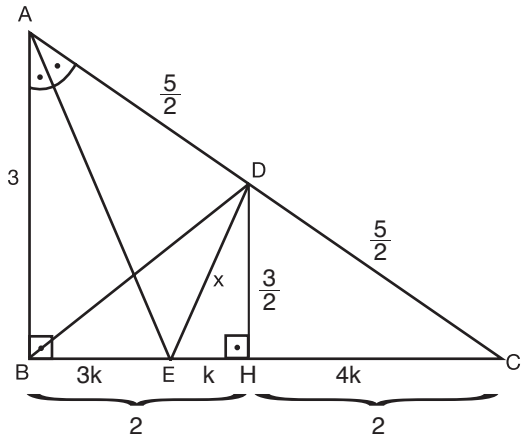


$m + k + n = 22$ br ve Ç(IED) = $m + k + n$ olduğundan Ç(IED) = 22 br'dir.

Cevap: A

AÇIORTAY

9.



$m(\widehat{B}) = 90^o$ ve $|BDI| = |ADI| = \frac{5}{2} \Rightarrow |DCI| = \frac{5}{2}$

(Muhteşem üçlü)

ABC dik üçgeni (3, 4, 5) üçgenidir.

$|DH| = \frac{3}{2}$'dir.

(Orta taban olduğundan) $|BHI| = |HCI| = 2$'dir.

ABC üçgeninde iç açıortay teoremine göre

$\frac{|AB|}{|AC|} = \frac{|BE|}{|EC|} = \frac{3}{5}$ $\quad |BE| = 3k$ dersek

$|EC| = 5k$ olur.

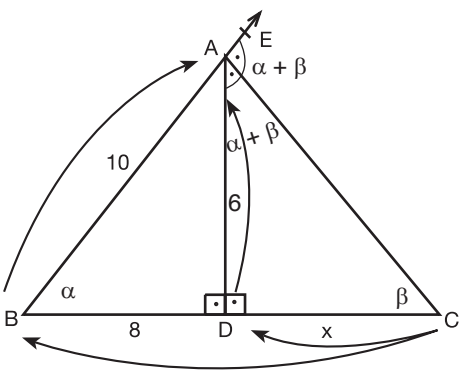
$3k + 5k = 4 \Rightarrow k = \frac{1}{2}$

DHE dik üçgenin pisagor uygulanırsa

$x^2 = \left(\frac{3}{2}\right)^2 + \left(\frac{1}{2}\right)^2 = \frac{10}{4} \Rightarrow x = \frac{\sqrt{10}}{2}$'dır.

Cevap: B

10.



ABD dik üçgeni (6, 8, 10) üçgenidir. $|ADI| = 6$ br

ABC üçgeninde $\widehat{EAC}$ dış açısı $m(\widehat{B}) + m(\widehat{C})$ eşit olduğundan $m(\widehat{EAC}) = \alpha + \beta$ 'dır.

ABD üçgeninde dış açıortay teoremine göre

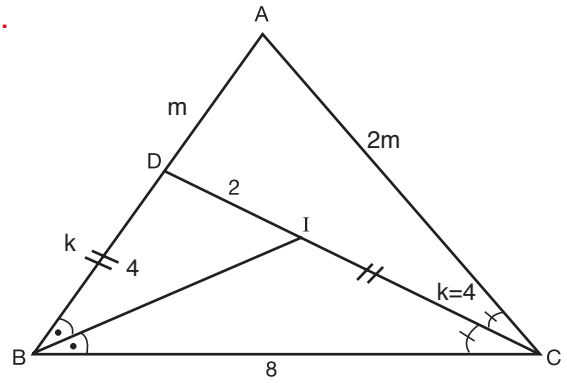
$\frac{x}{x+8} = \frac{6}{10} = \frac{3}{5}$ $\quad 5x = 3x + 24$

$2x = 24$

$x = 12$ br'dir.

Cevap: A

11.



BDC üçgeninde iç açıortay teoremine göre

$\frac{k}{2} = \frac{8}{k}$ $\quad k^2 = 16 \Rightarrow k = 4$'tür.

ABC üçgeninde iç açıortay teoremine göre

$\frac{|BC|}{|BD|} = \frac{|AC|}{|AD|} = \frac{8}{4} = 2$ $\quad |AC| = 2m$ dersek

$|AD| = m$ olur.

ABC üçgeninde iç açıortay uzunluk teoremine göre

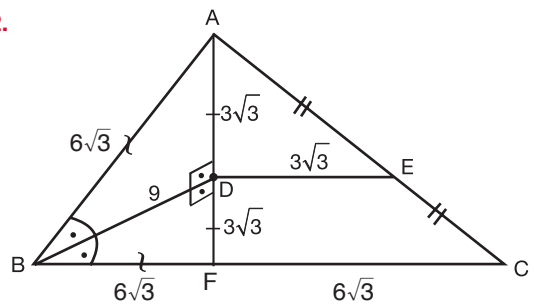
$|DCI|^2 = |ACI| \cdot |BCI| - |ADI| \cdot |BDI|$

$6^2 = 2m \cdot 8 - m \cdot 4$

$36 = 12\,m$ $\quad x = 2m = 6$ br

Cevap: B

12.



[AF] uzunluğu çizilirse

AFC üçgeninde [DE] orta taban olur.

$2 \cdot |DEI| = |FCI| \Rightarrow |FCI| = 6\sqrt{3}$, $|BFI| = 6\sqrt{3}$ olur.

ABF üçgeninde [BD] hem açıortay hem kenarortay olduğundan aynı zamanda yükseklik olur.

ABF üçgeni ikizkenar üçgen olmuş olur.

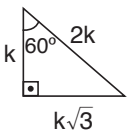
$|ABI| = |BFI| = 6\sqrt{3}$ 'tür.

ABD üçgeninde pisagor uygulanırsa $|ADI| = 3\sqrt{3}$ olduğu görülür. ABD üçgeni (30, 60, 90) üçgenidir.

$m(\widehat{ABD}) = 30^o$ dir.

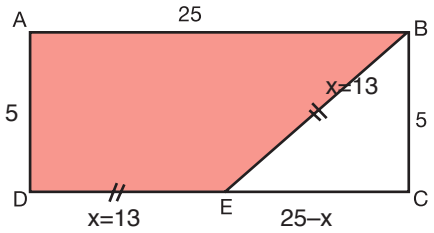
Cevap: C

Not:



DİK ÜÇGEN

1.



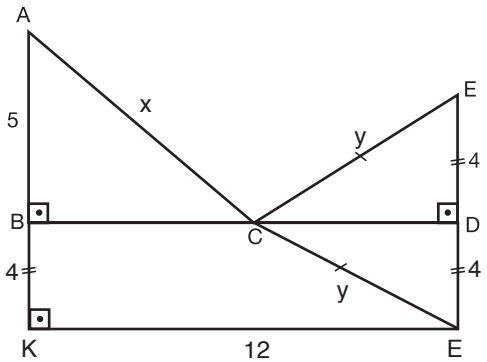
BEC üçgeni (5, 12, 13) üçgenidir.

x = 13'tür.

Ç(ADEB) = 5 + 25 + 13 + 13 = 56 br

Cevap: E

2.

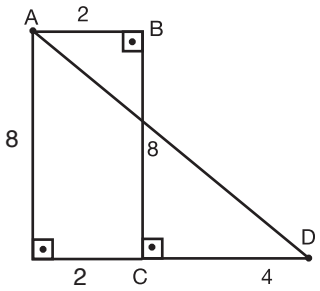


AKE üçgeni (9, 12, 15) üçgenidir.

|AC| + |CE| = x + y = 15'dir.

Cevap: C

3.

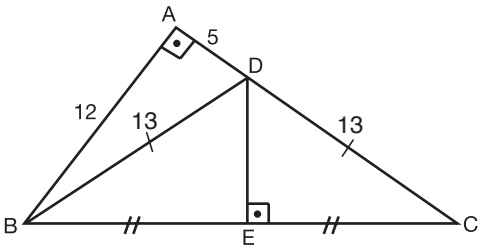


AHD üçgeni (6, 8, 10) üçgenidir.

|AD| = 10 br'dir.

Cevap: B

4.



ABD üçgeni (5, 12, 13) üçgenidir.

DBC üçgeninde [DE] hem yükseklik, hem kenarortay olduğundan DBC ügeni ikizkenar üçgendir.

|DC| = 13 br

ABC dik üçgeninde pisagor uygularsak

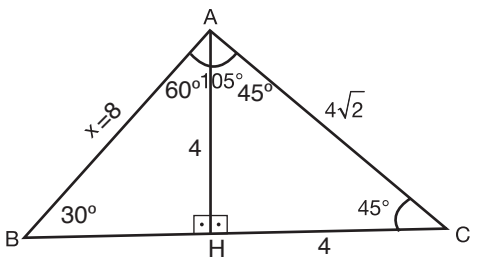
$12^2 + 18^2 = |BC|^2$

$468 = |BC|^2$

$|BC| = 6\sqrt{13}$ 'tür.

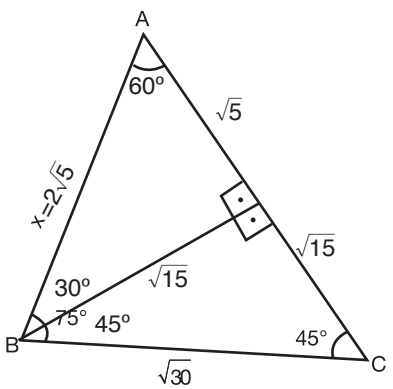
Cevap: C

5.



Cevap: E

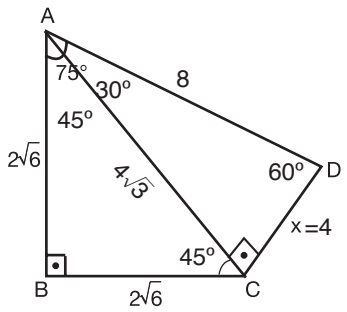
6.



Cevap: A

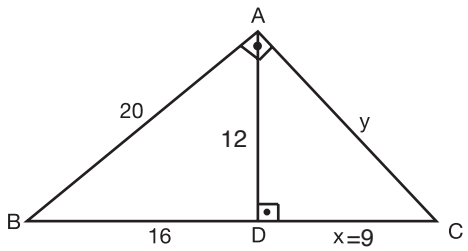
DİK ÜÇGEN

7.



Cevap: D

8.



ABD üçgeni (12, 16, 20) üçgenidir. $|AD| = 12$ br.

ABC üçgeninde öklid teoremi gereği

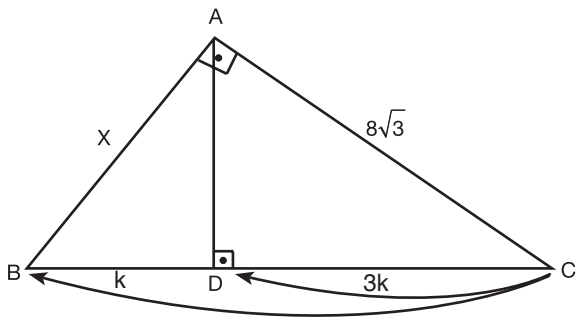
$12^2 = 16 \cdot x \Rightarrow x = 9$ br

ADC üçgeni (9, 12, 15) üçgenidir. $|AC| = y = 15$ br'dir.

$x + y = 9 + 15 = 24$ br'dir.

Cevap: D

9.



$\widehat{ABC}$'de öklid teoremi gereği

$(8\sqrt{3})^2 = 3k \cdot 4k$

$192 = 12k^2$

$k^2 = 16$

$k = 4$ br'dir.

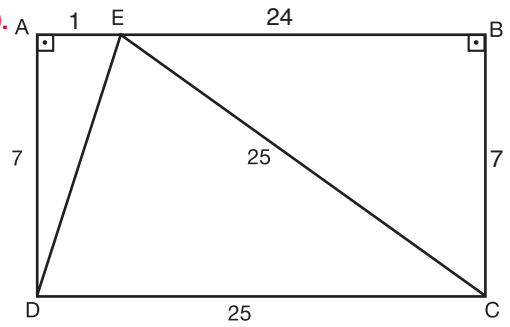
$x^2 = k \cdot 4k$

$x^2 = 4 \cdot 16 = 64$

$x = 8$ br'dir.

Cevap: C

10.

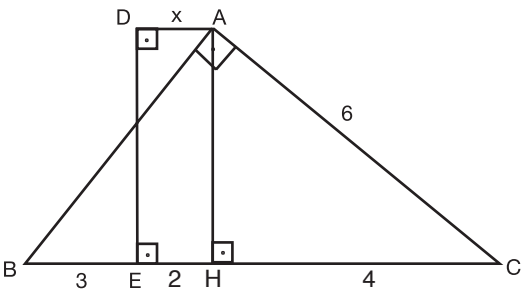


$\widehat{EBC}$ (7, 24, 25) üçgenidir. $|EB| = 24$ br

$|AE| = 1$ br'dir.

Cevap: A

11.



$\widehat{ABC}$'de öklid gereği

$|AC|^2 = |HC| \cdot |BC|$

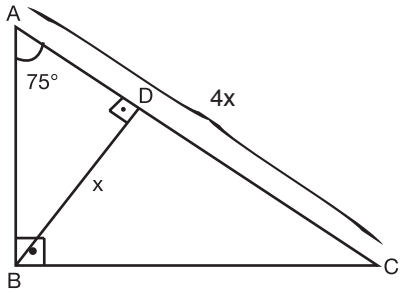
$6^2 = |HC| \cdot 9 \Rightarrow |HC| = 4$ br

AHED dikdörtgeninde $|AD| = |EH| = x = 2$ br

Cevap: B

DİK ÜÇGEN

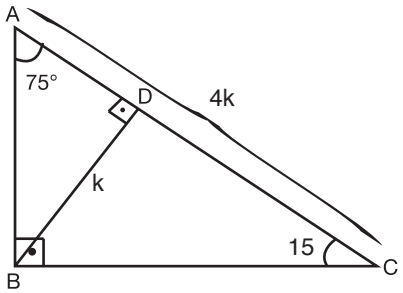
12.



(15, 75, 90) üçgenin dik köşeden hipotenüze indirilen dikme hipotenüsün $\frac{1}{4}$'ne eşittir.

$x + 4x = 25 \Rightarrow x = 5$ br'dir.

Not:



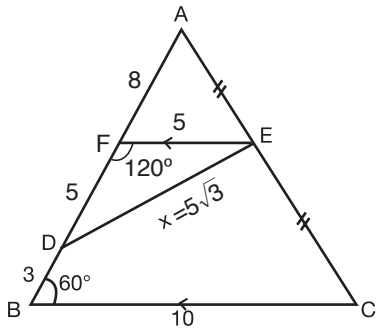
(15, 75, 90) üçgenin dik köşeden hipotenüse indirilen dikme hipotenüsün $\frac{1}{4}$'ine eşittir.

$x + 4x = 25 \Rightarrow x = 5$ br'dir.

Cevap: B

ÖZEL ÜÇGENLER

1.



[EF] orta taban $|FB| = |FA| = 8$ br

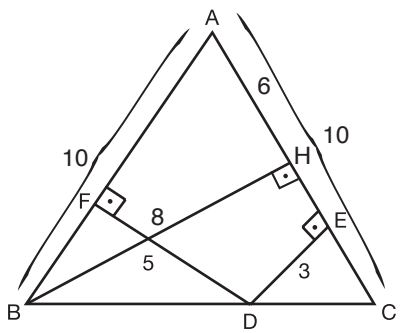
ve $|EF| = \frac{|BC|}{2} = \frac{10}{2} = 5$ br dir.

FDE üçgeni (30, 30, 120) üçgendir.

$x = 5\sqrt{3}$ 'tür.

Cevap: C

2.



ABC ikizkenar üçgeninde

$|BH| = |FD| + |ED| = 5 + 3 = 8$ br'dir.

ABH üçgeni (6, 8, 10) üçgenidir.

$|AH| = 6$, $|HC| = 4$ br'dir.

BHC üçgeninde pisagor uygulanırsa

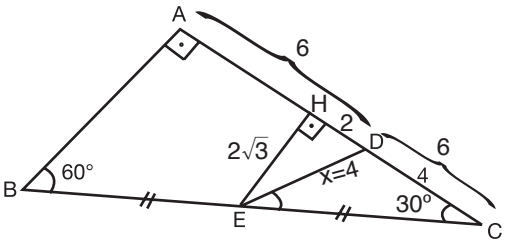
$|BH|^2 + |HC|^2 = |BC|^2$

$8^2 + 4^2 = |BC|^2$

$|BC| = 4\sqrt{5}$ br'dir.

Cevap: E

3.



[HE] orta taban olduğundan $|AH| = |HC| = 6$ br

ve $|HD| = 2$ br'dir.

HEC üçgeni (30, 60, 90)'dır.

$|HC| = 6$ br $\Rightarrow |HE| = 2\sqrt{3}$ br

HED üçgeninde pisagor uygulanırsa

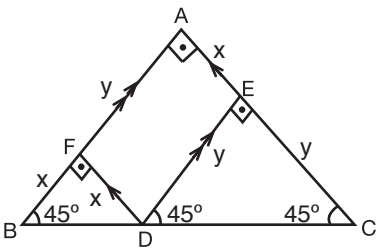
$|HD|^2 + |HE|^2 = x^2$

$2^2 + (2\sqrt{3})^2 = x^2$

$x = 4$ br

Cevap: B

4.

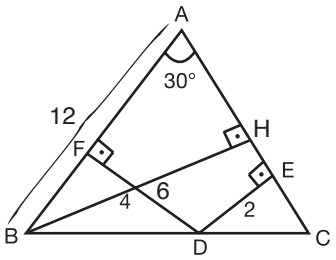


$x + y = 5\sqrt{2}$ br ve ABC ikizkenar dik üçgen olduğundan $|BC| = (5\sqrt{2}).\sqrt{2} = 10$ br'dir.

Cevap: E

ÖZEL ÜÇGENLER

5.



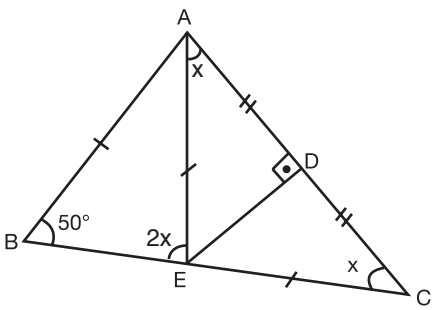
|BH| = |FD| + |DE| = 4 + 2 = 6 br

ABH üçgeni (30, 60, 90) üçgenidir.

|BH| = 6 br ⇒ |AB| = 12 br'dir.

Cevap: D

6.



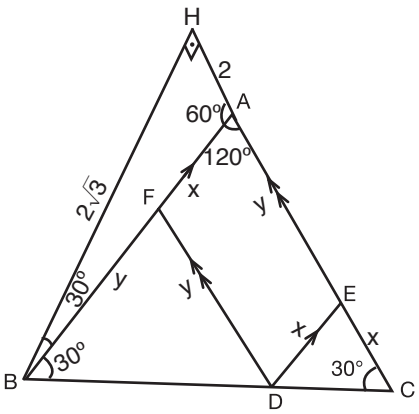
AEC ikizkenar üçgendir |AE| = |EC|

BAE ikizkenar üçgendir. $m(\hat{B}) = m(\hat{E})$

50 = 2x ⇒ x = 25°

Cevap: A

7.



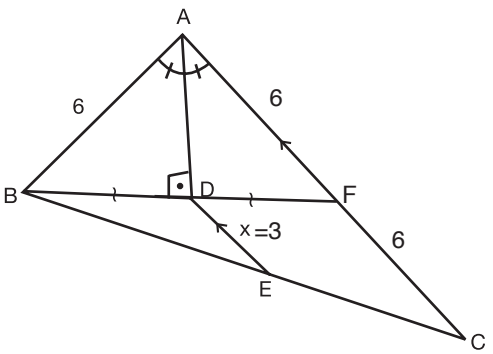
B'nin [AC]'ye en kısa uzaklığı B'den AC'ye indirilen dikmenin uzunluğudur. |BH| = $2\sqrt{3}$'tür.

ABH üçgeni (30, 60, 90) üçgenidir.

|BH| = $2\sqrt{3}$ ⇒ |AB| = x + y = |DE| + |DF| = 4 br'dir.

Cevap: C

8.



ABF üçgeni ikizkenardır. |AB| = |AF| = 6 br'dir.

|FC| = 6 br olur.

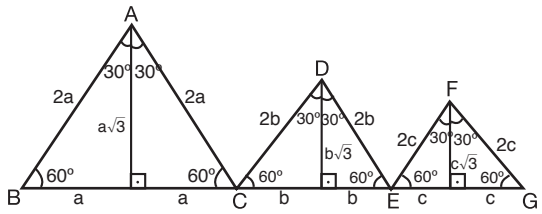
BFC üçgeninde [DE] = x orta tabandır.

$|DE| = \frac{|FC|}{2} = \frac{6}{2} = 3$ br'dir.

Cevap: C

ÖZEL ÜÇGENLER

9.



$a\sqrt{3} + b\sqrt{3} + c\sqrt{3} = 4\sqrt{3} \Rightarrow \sqrt{3}(a + b + c) = 4\sqrt{3}$

$a + b + c = 4$'tür.

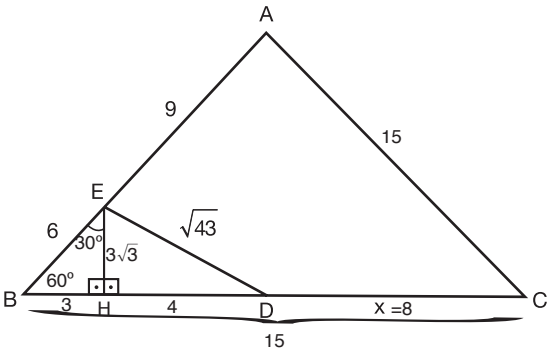
$Ç(ABC) + Ç(DCE) + Ç(FEG) = 6(a + b + c)$

$= 6 \cdot 4$

$= 24$ br'dir.

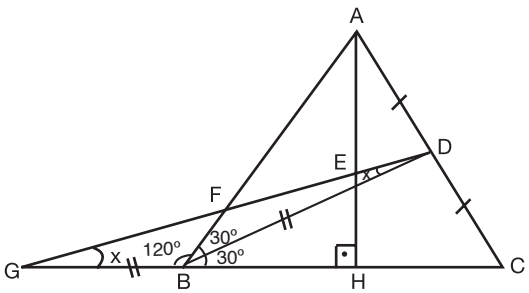
Cevap: D

11.



Cevap: A

10.

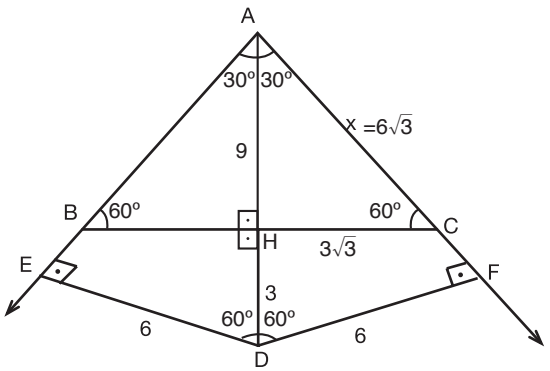


|AHI| = |BDI| = |GBI|'dir.

GBD üçgeninde $m(B) = 150^o \Rightarrow x = 15^o$ dir.

Cevap: D

12.



AED (30°, 60° 90°) üçgeninde

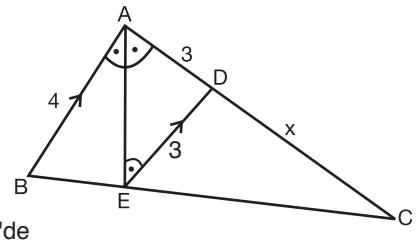
|ED| = 6 br ise |AD| = 12 br'dir. |AH| = 9 br'dir.AHC (30, 60, 90) üçgeninde

|AH| = 9 br ise |AC| = $x = 6\sqrt{3}$ br'dir.

Cevap: B

ÜÇGENDE BENZERLİK

1.

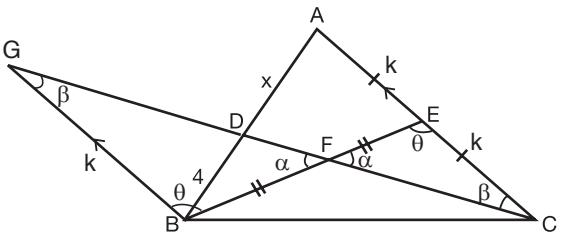


$\widehat{ABC}$'de

$\frac{|DE|}{|AB|} = \frac{|CD|}{|AC|}$, $\frac{3}{4} = \frac{x}{x+3} \Rightarrow x = 9$ br

Cevap: E

2.



GBD üçgeni FEC üçgenine eşittir. |GB| = k br

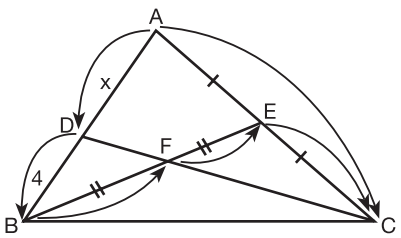
GBD ve CAD üçgenleri benzerdir.

$\frac{|GB|}{|AC|} = \frac{|BD|}{|AD|}$, $\frac{k}{2k} = \frac{4}{x} \Rightarrow x = 8$ br'dir.

Cevap: E

2. yol

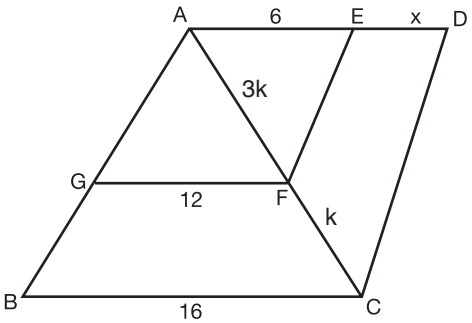
Menelaus Teoremi



$\frac{|EC|}{|AC|} \cdot \frac{|AD|}{|AB|} \cdot \frac{|BF|}{|FE|} = 1$

$\frac{1}{2} \cdot \frac{x}{4} \cdot \frac{1}{1} = 1$ x = 8 br

3.



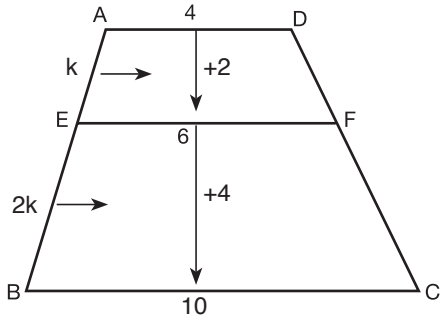
$\widehat{ABC}$'de $\frac{|GF|}{|BC|} = \frac{|AF|}{|AC|}$, $\frac{12}{16} = \frac{3}{4}$

|AF| = 3k dersek |AC| = 4k olur.

$\widehat{ACD}$'de $\frac{|AF|}{|FC|} = \frac{|AE|}{|ED|}$, $\frac{3k}{k} = \frac{6}{x} \Rightarrow x = 2$'dir.

Cevap: B

4.



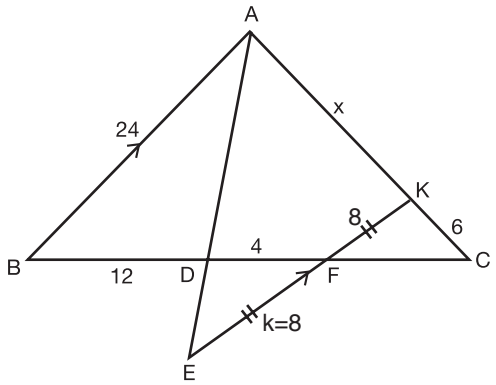
k da 2 br artarsa

2k'da 4 br artar |BC| = 10 br'dir.

Cevap: C

ÖZEL ÜÇGENLER

5.



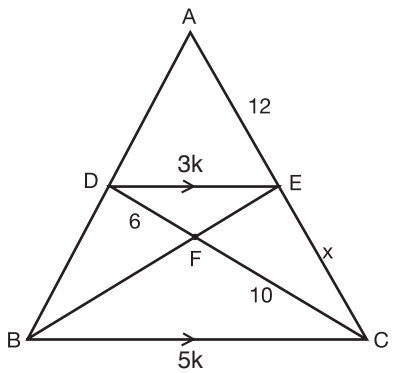
$\frac{|DF|}{|BD|} = \frac{|EF|}{|AB|}$, $\frac{4}{12} = \frac{k}{24} \Rightarrow k = 8$'dir.

$\widehat{ABC}$'de $\frac{|KC|}{|AC|} = \frac{|KF|}{|AB|}$, $\frac{8}{24} = \frac{6}{6+x}$

$\Rightarrow x = 12$ br'dir.

Cevap: A

6.



$\frac{|DF|}{|FC|} = \frac{|DE|}{|BC|} = \frac{6}{10}$ $|DE| = 3k$ dersek

$|BC| = 5k$ olur.

$\widehat{ABC}$'de $\frac{|DE|}{|BC|} = \frac{|AE|}{|AC|}$, $\frac{3k}{5k} = \frac{12}{12+x}$

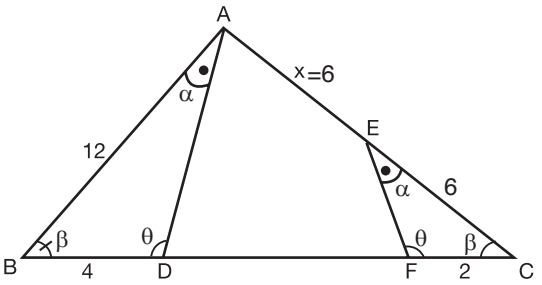
$\Rightarrow 36 + 3x = 60$

$3x = 24$

$x = 8$

Cevap: D

7.



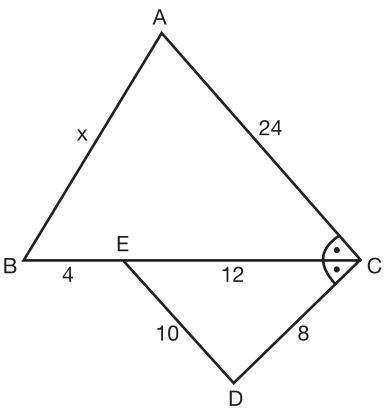
$\widehat{ABD} \approx \widehat{ECF}$'dir.

$\frac{|BD|}{|FC|} = \frac{|AB|}{|EC|}$, $\frac{4}{2} = \frac{12}{|EC|} \Rightarrow |EC| = 6$ br

$|AB| = |AC| = 12$ br olduğundan $x = 6$ br'dir.

Cevap: C

8.



$\widehat{CAB} \approx \widehat{CED}$ (K. A. K)

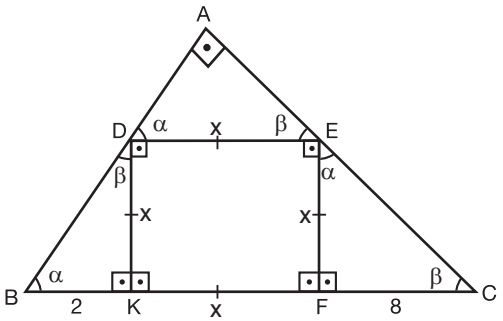
$\frac{|CA|}{|CE|} = \frac{|AB|}{|ED|} = \frac{|CB|}{|CD|} \Rightarrow \frac{24}{12} = \frac{x}{10} = \frac{16}{8}$

$x = 20$

Cevap: E

ÖZEL ÜÇGENLER

9.



$\widehat{KBD} \approx \widehat{FEC}$'dir.

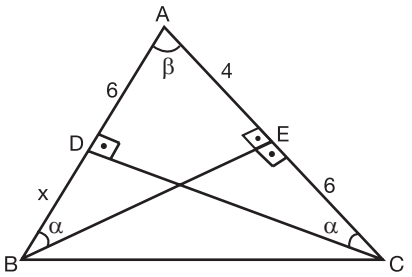
$$\frac{|BK|}{|EF|} = \frac{|DK|}{|FC|},\ \frac{2}{x} = \frac{x}{8} \Rightarrow x^2 = 16$$

$x = 4$ br'dir.

$A(DEFK) = x^2 = 16\,br^2$

Cevap: C

11.



$\widehat{EBA} \approx \widehat{DCA}$'dir.

$$\frac{|EA|}{|DA|} = \frac{|BA|}{|CA|},\ \frac{\cancel{4}^{2}}{\cancel{6}_{3}} = \frac{x+6}{10}$$

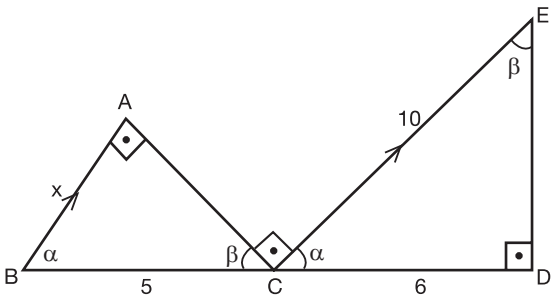
$$20 = 3x + 18$$

$$3x = 2$$

$$x = \frac{2}{3}$$

Cevap: A

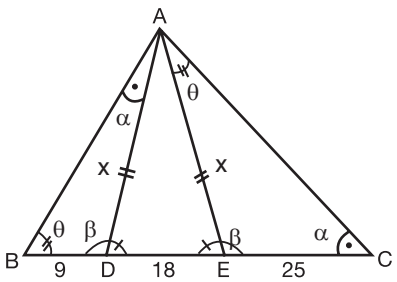
10.



$$\frac{|AB|}{|CD|} = \frac{|BC|}{|CE|},\ \frac{x}{6} = \frac{5}{10} \Rightarrow x = 3\,br$$

Cevap: D

12.



$\widehat{ADB} \approx \widehat{CEA}$

$$\frac{|BD|}{|EA|} = \frac{|AD|}{|CE|},\ \frac{9}{x} = \frac{x}{25} \Rightarrow x^2 = 9.25$$

$$x = 15$$

$$Ç(ADE) = 2x + 18$$

$$= 30 + 18$$

$$= 48\,br$$

Cevap: D