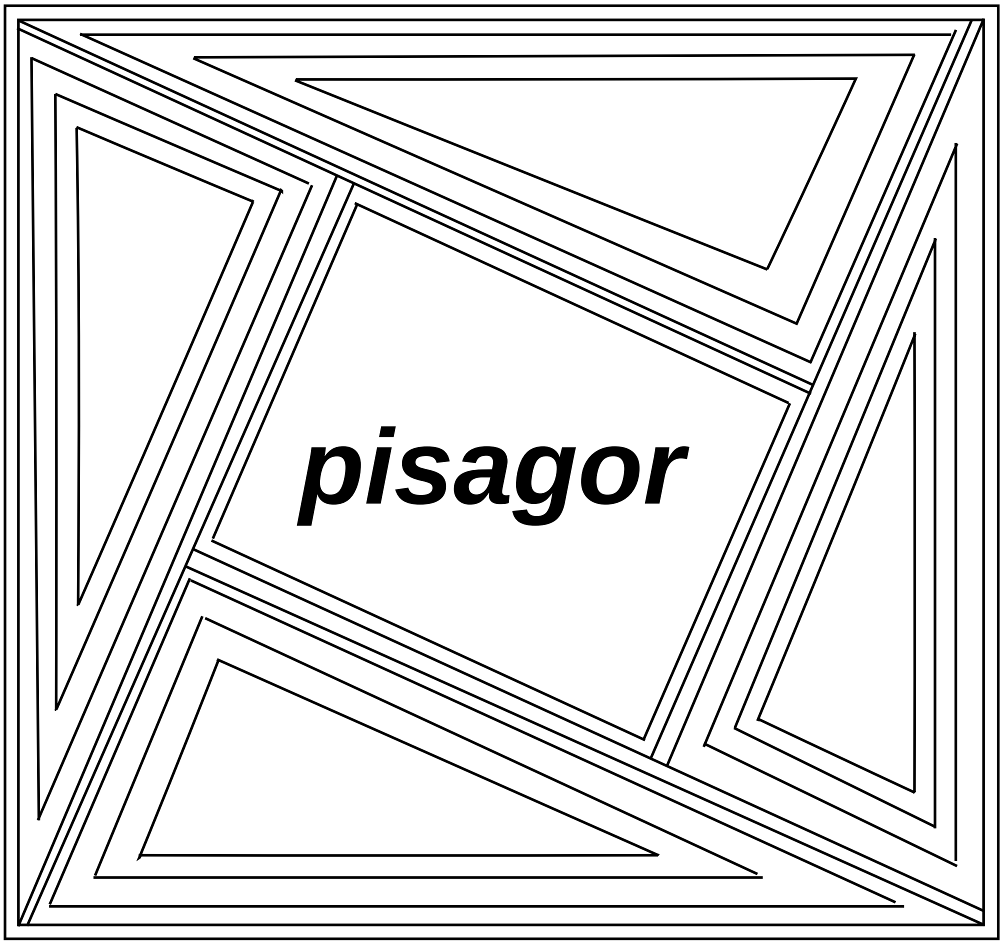
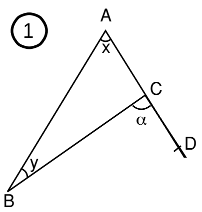
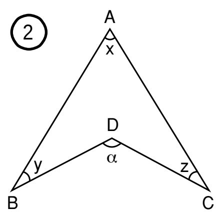

pisagor

ÜÇGENDE AÇILAR

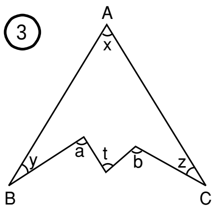
■ Bir üçgende, iç açıların ölçüleri toplamı 180°, dış açıların ölçüleri toplamı 360° dir.

1 

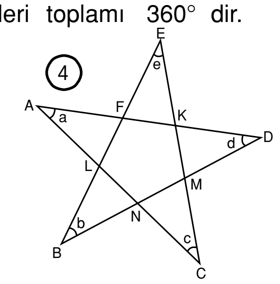
$\alpha = x + y$

2 

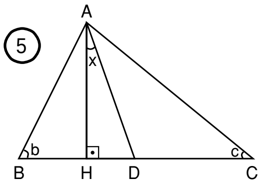
$\alpha = x + y + z$

3 

$a + b = x + y + z + t$

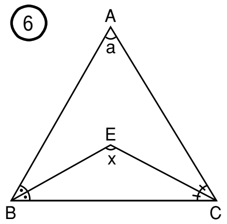
4 

$a + b + c + d + e = 180°$

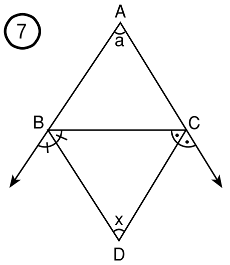
5 

[AH] yükseklik [AD] açıortay ise

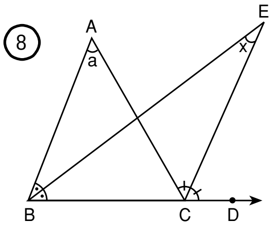
$x = \dfrac{|b - c|}{2}$

6 

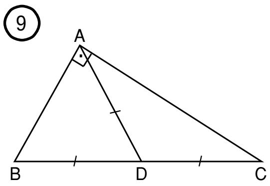
$x = 90° + \dfrac{a}{2}$

7 

$x = 90° - \dfrac{a}{2}$

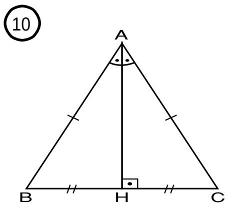
8 

$x = \dfrac{a}{2}$

9 

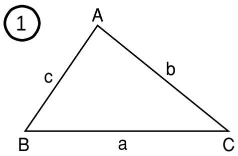
$|BD| = |DC| = |AD|$

(muhteşem üçlü)

10 

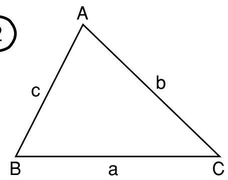
(muhteşem dörtlü)

ÜÇGENDE AÇI-KENAR BAĞINTILARI

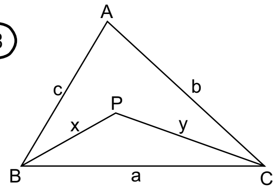
1 

$a > b > c$ ise

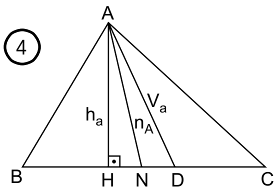
$m(\widehat{A}) > m(\widehat{B}) > m(\widehat{C})$

2 

$|b - c| < a < b + c$

3 

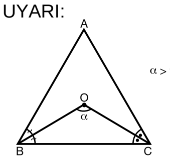
$a < x + y < b + c$

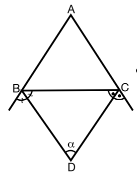
4 

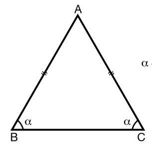
$h_a \le n_A \le V_a$

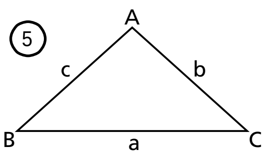
8

UYARI:



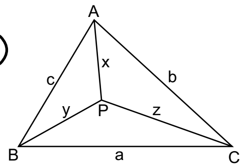




5 

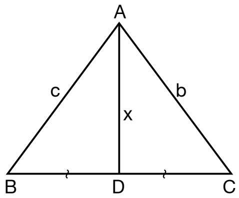
■ $m(\widehat{A}) < 90°$ $a^2 < b^2 + c^2$

■ $m(\widehat{A}) > 90°$ $a^2 > b^2 + c^2$

6 

Ç(ABC) = 2u olarak verilmişse
$u < x + y + z < 2u$

a, b ve c kenarları ayrı ayrı verilmişse
$u < x + y + z <$ en uzun iki kenar toplamı

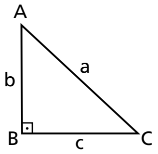
7 

ABC üçgen, [AD] kenarortay

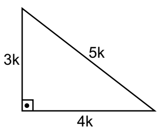
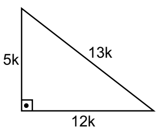
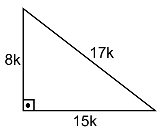
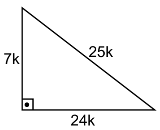
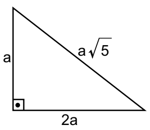
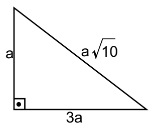
$\dfrac{|b - c|}{2} < x < \dfrac{b + c}{2}$

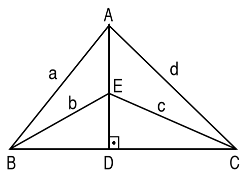
Dik Üçgen

Pisagor Teoremi

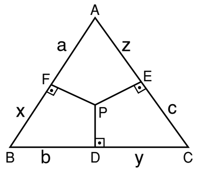


$a^2 = b^2 + c^2$

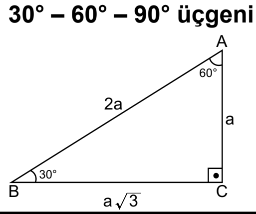


$a^2 + c^2 = b^2 + d^2$

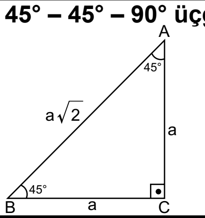


$a^2 + b^2 + c^2 = x^2 + y^2 + z^2$

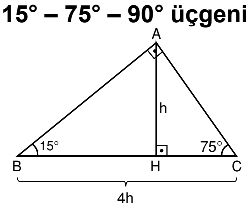
30° – 60° – 90° üçgeni



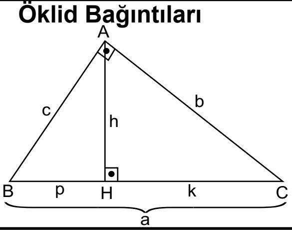
45° – 45° – 90° üçgeni



15° – 75° – 90° üçgeni

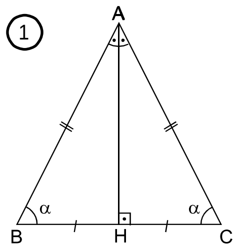


Öklid Bağıntıları

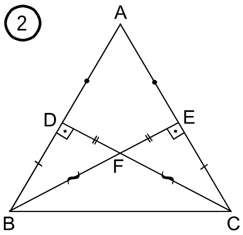


1. $h^2 = p \cdot k$
2. $a.h = b.c$
3. $b^2 = k \cdot a$
4. $c^2 = p \cdot a$

İKİZKENAR ÜÇGEN

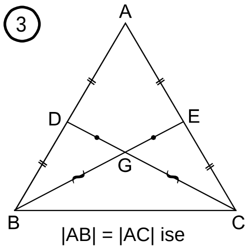
1


(muhteşem dörtlü)

2


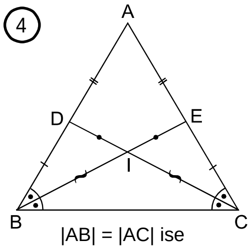
|AB| = |AC| ise

|BE| = |DC|

3


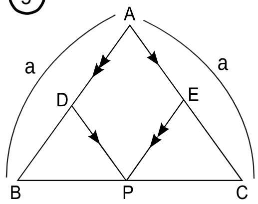
|AB| = |AC| ise

|BE| = |DC|

4


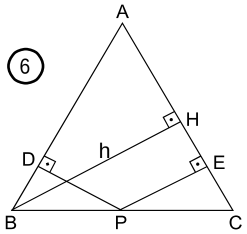
|AB| = |AC| ise

|BE| = |DC|

5


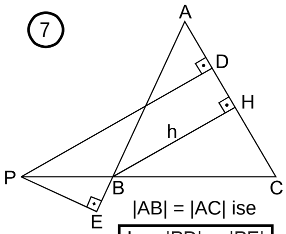
|AB| = |AC| ise

$\boxed{a = |PD| + |PE|}$

6


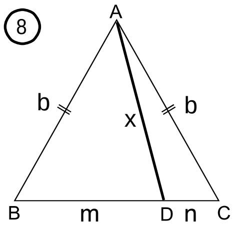
|AB| = |AC| ise

$\boxed{h = |PD| + |PE|}$

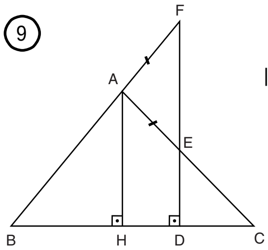
7


|AB| = |AC| ise

$\boxed{h = |PD| - |PE|}$

8


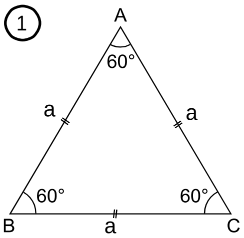
$\boxed{x^2 = b^2 - m.n}$

9


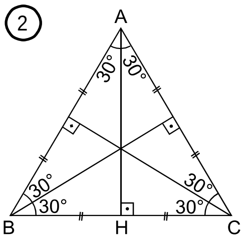
|AB| = |AC| ise

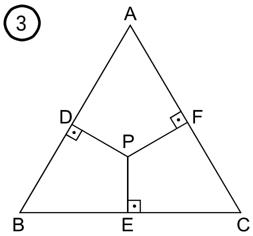
|AF| = |AE|

EŞKENAR ÜÇGEN

1


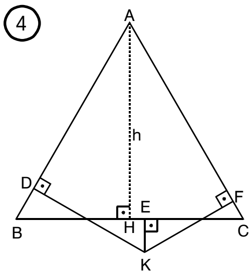
$\boxed{Alan(\widehat{ABC}) = \frac{a^2\sqrt{3}}{4}}$

2


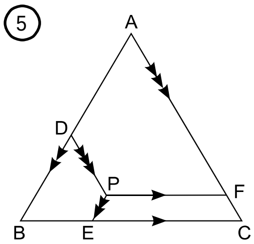
3


ABC eşkenar üçgen

$\boxed{h = |PD| + |PE| + |PF|}$

4


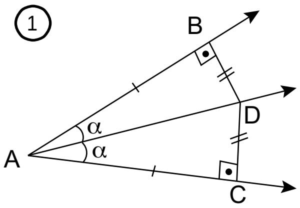
$\boxed{|KD| + |KF| - |KE| = h}$

5


ABC eşkenar üçgen

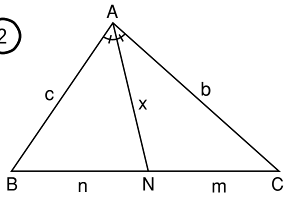
$\boxed{|AB| = |PD| + |PE| + |PF|}$

ÜÇGENDE AÇIORTAY

1


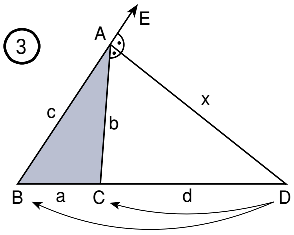
|BD| = |DC|

|AB| = |AC|

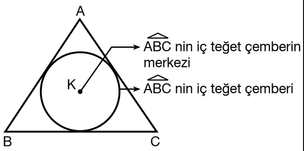
2


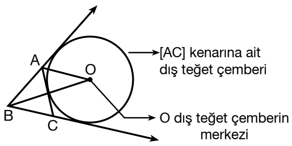
$\boxed{\frac{b}{c} = \frac{m}{n}}$ veya $\boxed{\frac{c}{n} = \frac{b}{m}}$

$\boxed{x^2 = b.c - m.n}$

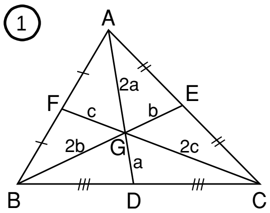
3


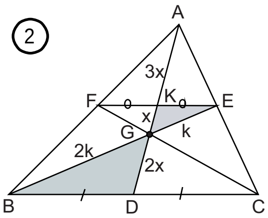
$\boxed{\frac{d}{d+a} = \frac{b}{c}}$ $\boxed{x^2 = d.(d+a) - b.c}$

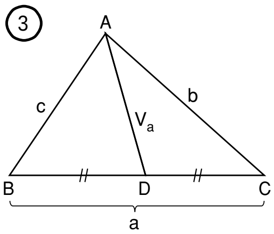
4




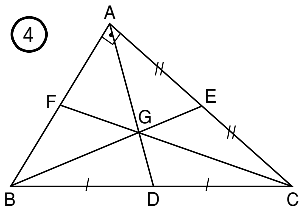
ÜÇGENDE KENARORTAY

1


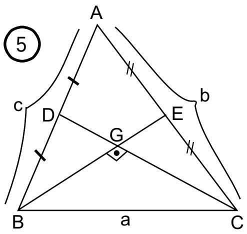
2


3


$\boxed{2V_a^2 = b^2 + c^2 - \frac{a^2}{2}}$

4


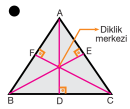
$\boxed{5V_a^2 = V_b^2 + V_c^2}$

5


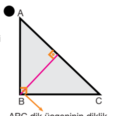
$\boxed{5a^2 = b^2 + c^2}$

YÜKSEKLİK

- Bir üçgenin üç yüksekliği bir noktada kesişir. Bu noktaya üçgenin diklik merkezi denir.



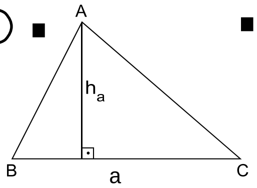
ABC dar açılı üçgenin diklik merkezi iç bölgededir.



ABC dik üçgeninin diklik merkezi dik olan köşedir.

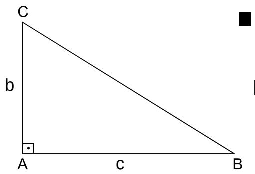
ÜÇGENDE ALAN

1 ■



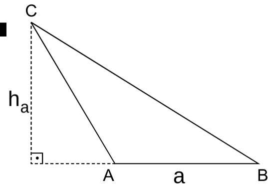
$$\text{Alan}(\widehat{ABC}) = \frac{a.h_a}{2}$$

■



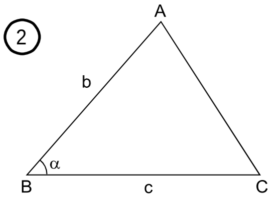
$$\text{Alan}(\widehat{ABC}) = \frac{b\ .\ c}{2}$$

■



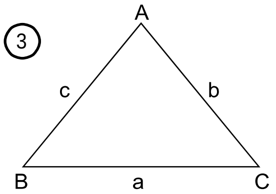
$$\text{Alan}(\widehat{ABC}) = \frac{a.h_a}{2}$$

2



$$\text{Alan}(\widehat{ABC}) = \frac{1}{2}.b.c.\sin\alpha$$

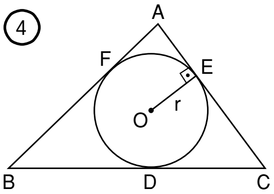
3



$u = \dfrac{a+b+c}{2}$ olmak üzere,

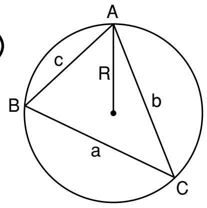
$$A(\widehat{ABC}) = \sqrt{u.(u-a).(u-b).(u-c)}$$

4



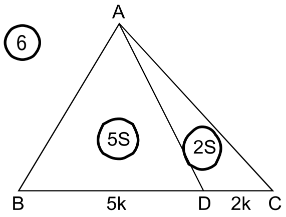
$$A(\widehat{ABC}) = u.r$$

5

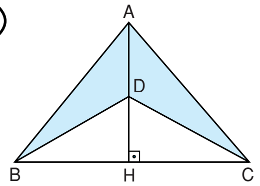


$$A(\widehat{ABC}) = \frac{a.b.c}{4R}$$

6

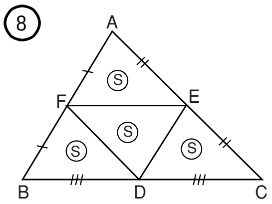


7

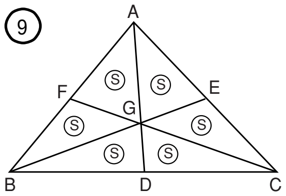


$$A(ABDC) = \frac{|AD|.|BC|}{2}$$

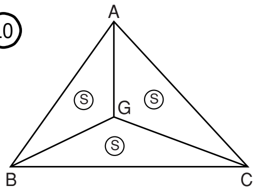
8



9

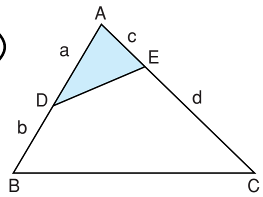


10



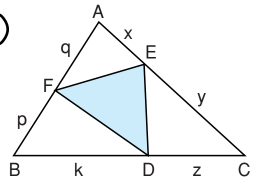
ABC üçgeninde G, ağırlık merkezi ise,

11



$$\frac{A(ADE)}{A(ABC)} = \frac{a}{a+b}\cdot\frac{c}{c+d}$$

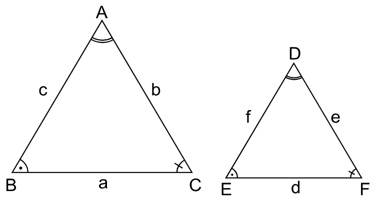
12



$$\frac{A(FDE)}{A(ABC)} = \frac{q.k.y + p.z.x}{(p+q).(k+z).(x+y)}$$

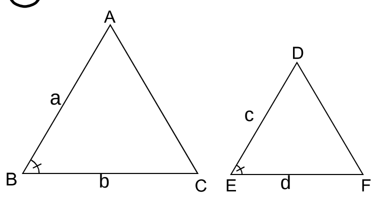
ÜÇGENLERDE BENZERLİK

1 Açı - Açı (A.A.) Benzerliği



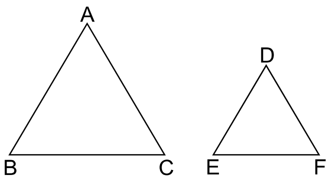
$$\widehat{ABC} \sim \widehat{DEF} \qquad \boxed{\frac{a}{d} = \frac{b}{e} = \frac{c}{f}}$$

2 Kenar - Açı - Kenar Benzerliği



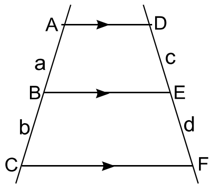
$\boxed{\dfrac{a}{c} = \dfrac{b}{d}}$ ve $m(\widehat{B}) = m(\widehat{E})$ ise, $\widehat{ABC} \sim \widehat{DEF}$

3 Kenar - Kenar - Kenar Benzerliği



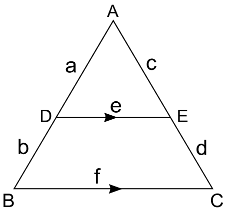
$\dfrac{|AB|}{|DE|} = \dfrac{|BC|}{|EF|} = \dfrac{|AC|}{|DF|}$ ise, $\widehat{ABC} \sim \widehat{DEF}$

4 Thales Teoremi



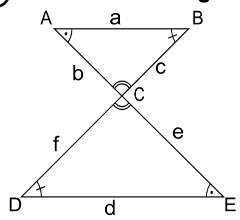
$$\boxed{\frac{a}{b} = \frac{c}{d}} \qquad \boxed{\frac{a}{c} = \frac{b}{d}}$$

5 Temel Orantı Teoremi



$$\boxed{\frac{a}{a+b} = \frac{c}{c+d} = \frac{e}{f}}$$

6 Kelebek Benzerliği



$$\boxed{\frac{a}{d} = \frac{b}{e} = \frac{c}{f}}$$

- Benzer üçgenlerin, eşit açılarının karşısındaki kenarları, yardımcı elemanları ve çevreleri orantılıdır.

  $\dfrac{a}{d} = \dfrac{b}{e} = \dfrac{c}{f} = k$ (benzerlik oranı)

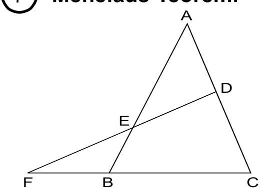
  $\dfrac{h_a}{h_d} = \dfrac{n_A}{n_D} = \dfrac{V_a}{V_d} = k \qquad \dfrac{\text{Çevre}(\widehat{ABC})}{\text{Çevre}(\widehat{DEF})} = k$

- Benzer üçgenlerin alanlarının oranı benzerlik oranının karesine eşittir.

  $\dfrac{\text{Alan}(\widehat{ABC})}{\text{Alan}(\widehat{DEF})} = k^2$

- Benzerlik oranı k = 1 olan üçgenler eştir.

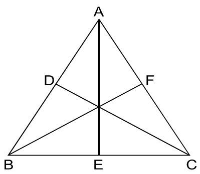
7 Menelaus Teoremi



$$\frac{|FB|}{|FC|}\cdot\frac{|CD|}{|DA|}\cdot\frac{|AE|}{|EB|} = 1$$

$$\frac{|AD|}{|AC|}\cdot\frac{|CB|}{|BF|}\cdot\frac{|FE|}{|ED|} = 1$$

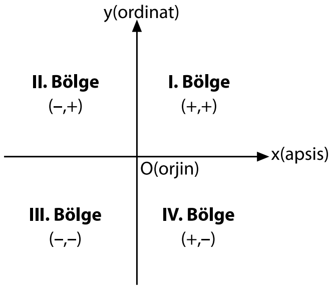
8 Seva Teoremi



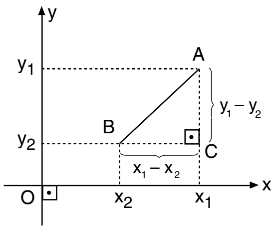
$$\frac{|AD|}{|DB|}\cdot\frac{|BE|}{|EC|}\cdot\frac{|CF|}{|FA|} = 1$$

Doğrunun Analitik İncelenmesi

KOORDİNAT DÜZLEMİ

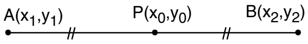


İki Nokta Arası Uzaklık



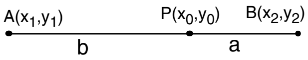
$$|AB| = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

Doğru Parçasının Orta Noktası



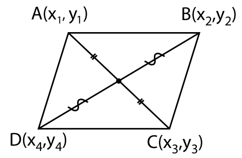
$$x_0 = \frac{x_1 + x_2}{2} \qquad y_0 = \frac{y_1 + y_2}{2}$$

Doğru Parçasını Belli Oranda Bölme



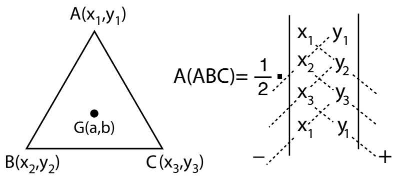
$$\frac{a}{b} = \frac{x_2 - x_0}{x_0 - x_1} \qquad \frac{a}{b} = \frac{y_2 - y_0}{y_0 - y_1}$$

NOT :
Köşegenleri birbirini ortalayan dörtgenlerde



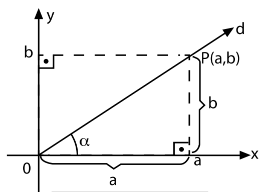
$$x_1 + x_3 = x_2 + x_4 \qquad y_1 + y_3 = y_2 + y_4$$

Üçgenin Ağırlık Merkezi ve Alanı



$$a = \frac{x_1 + x_2 + x_3}{3} \qquad b = \frac{y_1 + y_2 + y_3}{3}$$

Doğrunun Eğimi



$$m_d = \tan\alpha = \frac{b}{a}$$

Eğim açısı α olan bir doğruda,

- $0° < \alpha < 90°$ ise eğim m pozitiftir.
- $90° < \alpha < 180°$ ise eğim m negatiftir.

NOT :

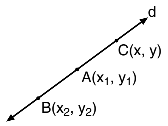
- iki noktası bilinen doğrunun eğimi: $m = \dfrac{y_2 - y_1}{x_2 - x_1}$
- $y = ax + b$ doğrusunun eğimi m dir.
- $ax + by + c = 0$ doğrusunun eğimi $m = -\dfrac{a}{b}$
- İki doğru paralel ise eğimleri eşittir.
- iki doğru dik ise eğimlerini çarpımı –1 dir.
- x eksenine paralel doğruların eğimi sıfırdır.
- y eksenine paralel doğruların eğimi tanımsızdır.

Eğim ve Bir Noktası Bilinen Doğrunun Denklemi

Eğimi m olan ve $A(x_1, y_1)$ noktasından geçen doğrunun denklemi:

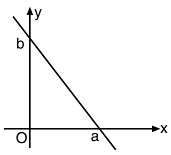
$$y - y_1 = m(x - x_1)$$

İki Noktası Bilinen Doğrunun Denklemi



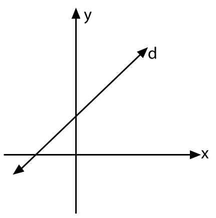
$$\frac{y - y_1}{y_1 - y_2} = \frac{x - x_1}{x_1 - x_2}$$

Eksenleri Kesen Doğruların Denklemi

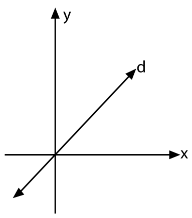


$$\frac{x}{a} + \frac{y}{b} = 1$$

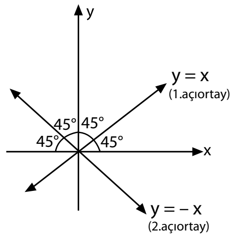
Özel Doğrular

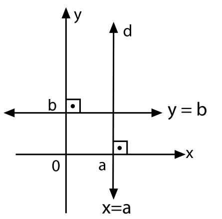


d doğrusunun denklemi,
$ax + by + c = 0$ şeklindedir.



d doğrusunun denklemi,
$ax + by = 0$ şeklindedir.





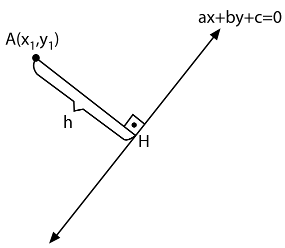
İki Doğrunun Birbirine Göre Durumları

$$a_1x + b_1y + c_1 = 0$$
$$a_2x + b_2y + c_2 = 0$$

1. $\dfrac{a_1}{a_2} = \dfrac{b_1}{b_2} \neq \dfrac{c_1}{c_2}$ ise doğrular paraleldir.
2. $\dfrac{a_1}{a_2} = \dfrac{b_1}{b_2} = \dfrac{c_1}{c_2}$ ise doğrular çakışıktır.
3. $\dfrac{a_1}{a_2} \neq \dfrac{b_1}{b_2}$ ise doğrular bir noktada kesişir.

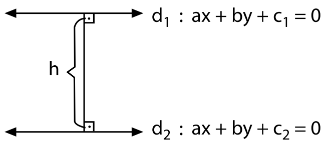
Bir Noktanın Bir Doğruya Dik (En Yakın) Uzaklığı

$$h = \frac{|ax_1 + by_1 + c|}{\sqrt{a^2 + b^2}}$$

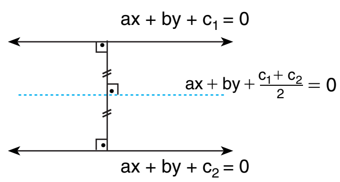


Paralel İki Doğru Arasındaki Uzaklık

$$h = \frac{|c_1 - c_2|}{\sqrt{a^2 + b^2}}$$



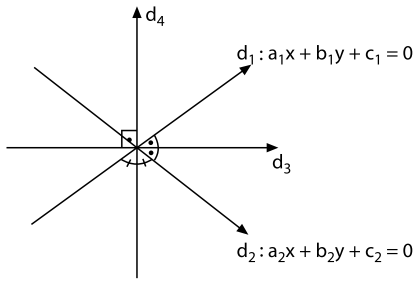
NOT :
Paralel doğrulara eşit uzaklıktaki noktaların geometrik yeri,



Açıortay Denklemleri

$$d_3, d_4: \quad \frac{|a_1x + b_1y + c_1|}{\sqrt{a_1^2 + b_1^2}} = \frac{|a_2x + b_2y + c_2|}{\sqrt{a_2^2 + b_2^2}}$$

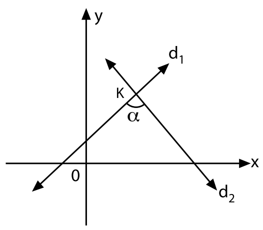
(d_1 ve d_2 doğrularının açıortayları d_3 ve d_4 tür.)



İki Doğru Arasındaki Açının Tanjantı

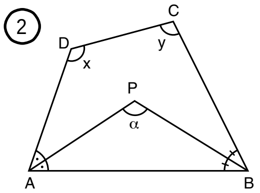
$$\tan\alpha = \left| \frac{m_1 - m_2}{1 + m_1 \cdot m_2} \right|$$

(Formüldeki α iki doğru arasındaki dar açıdır.)

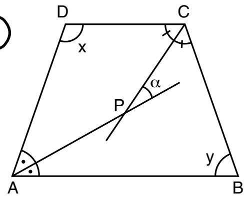


DÖRTGENLER

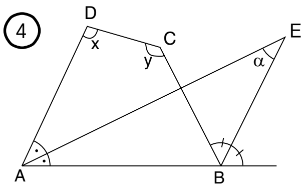
1. Dörtgenin iç açılarının ölçüleri toplamı 360° dir. Dış açılarının ölçüleri toplamı da 360° dir.

2.


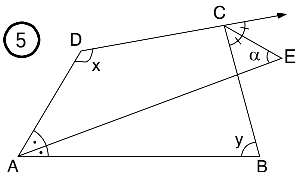
$\alpha = \dfrac{x+y}{2}$

3.


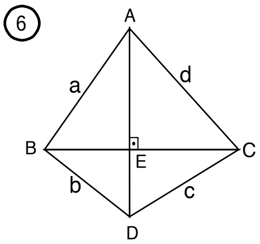
$\alpha = \dfrac{|x-y|}{2}$

4.


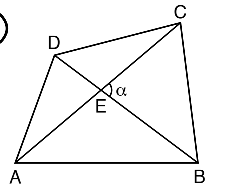
$\alpha = \dfrac{x+y}{2} - 90°$

5.


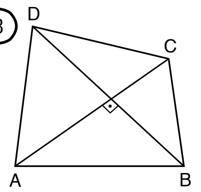
$\alpha = 90° - \dfrac{|x-y|}{2}$

6.


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

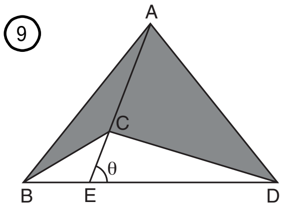
7.


$A(ABCD) = \dfrac{1}{2}.e.f.\sin\alpha$

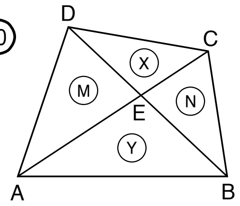
8.


$|AC| = e$ $|BD| = f$ ise

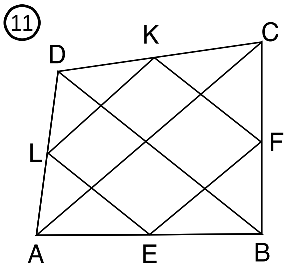
$A(ABCD) = \dfrac{e.f}{2}$

9.


$A(ABCD) = \dfrac{|AC| \cdot |BD| \cdot \sin\theta}{2}$

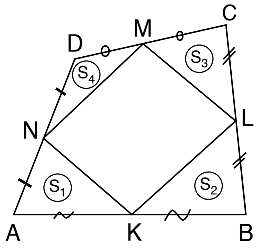
10.


$M.N = X.Y$

11.


L, E, F ve K kenar orta noktaları ise

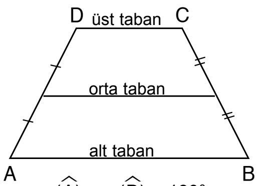
- ✳ EFKL paralelkenardır.
- ✳ Çevre(EFKL) = |AC| + |BD|
- ✳ [DB] ⊥ [AC] ⇒ EFKL dikdörtgendir.
- ✳ |DB| = |AC| ⇒ EFKL eşkenar dörtgendir.
- ✳ |DB| = |AC| ve [DB] ⊥ [AC] ⇒ EFKL karedir.

12.


$S_1 + S_3 = S_2 + S_4$

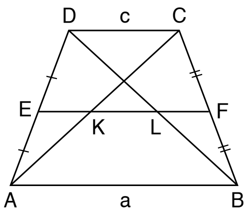
$A(KLMN) = \dfrac{A(ABCD)}{2}$

YAMUK

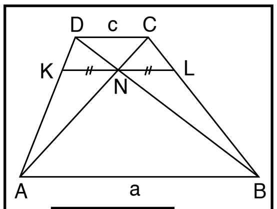


$m(\widehat{A}) + m(\widehat{D}) = 180°$

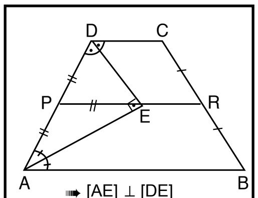
$m(\widehat{B}) + m(\widehat{C}) = 180°$



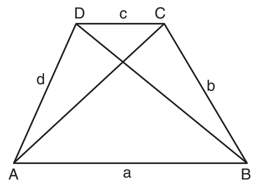
$|EF| = \dfrac{a+c}{2}$ $|KL| = \dfrac{a-c}{2}$



$|KL| = \dfrac{2.a.c}{a+c}$

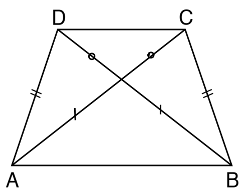


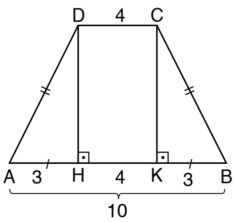
- ➠ [AE] ⊥ [DE]
- ➠ [PR] orta taban
- ➠ |AP| = |PD| = |PE|

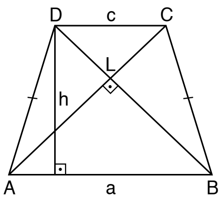


$b^2 + d^2 + 2a.c = |AC|^2 + |BD|^2$

İkizkenar Yamuk

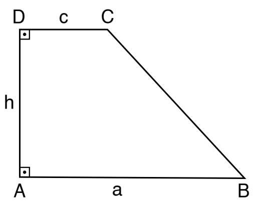


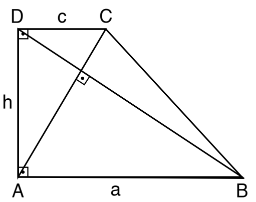




$[AC] \perp [DB]$ ise $h = \dfrac{a+c}{2}$

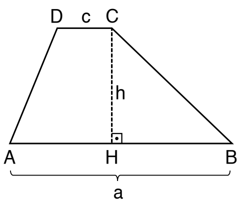
Dik Yamuk



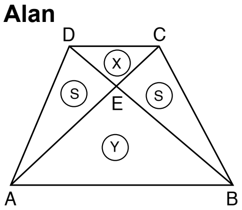


$h^2 = a.c$

Yamuksal Bölgenin Alan

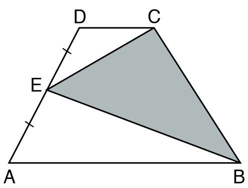


$A(ABCD) = \dfrac{(a+c).h}{2}$

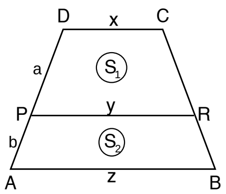


$S.S = X.Y$

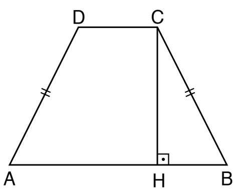
$A(ABCD) = \left(\sqrt{X} + \sqrt{Y}\right)^2$



$A(BEC) = \dfrac{A(ABCD)}{2}$

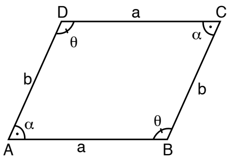


$\dfrac{a}{b} = \dfrac{x-y}{y-z}$ $\dfrac{S_1}{S_2} = \dfrac{x^2-y^2}{y^2-z^2}$

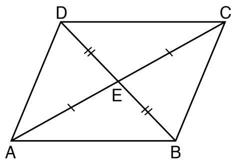


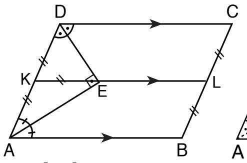
$A(ABCD) = |AH|.|CH|$

PARALELKENAR

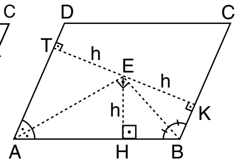


$\boxed{\alpha+\theta=180}$

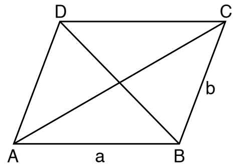




$[AE] \perp [DE]$

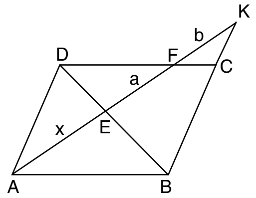


$|TK| = 2h$

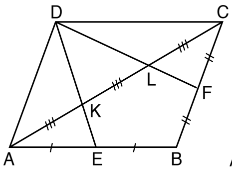


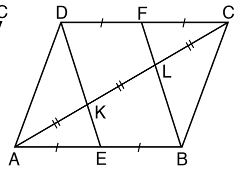
$|AC| = e,\ |BD| = f$

$\boxed{e^2 + f^2 = 2(a^2 + b^2)}$



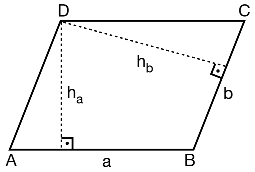
$\boxed{x^2 = a.(a + b)}$





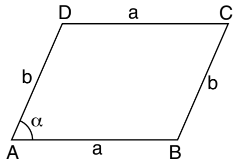
[AC] köşegen ise

$|AK| = |KL| = |LC|$

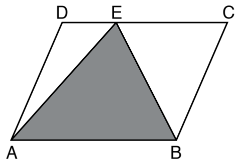


$Ç(ABCD) = 2.(a + b)$

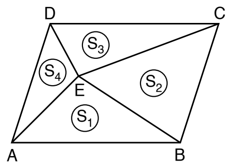
$A(ABCD) = a\ .\ h_a = b\ .\ h_b$



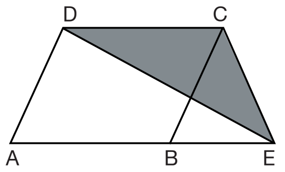
$\text{Alan}(ABCD) = a.b.\sin\alpha$



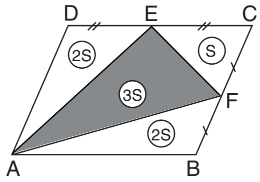
$A(ABE) = \dfrac{A(ABCD)}{2}$

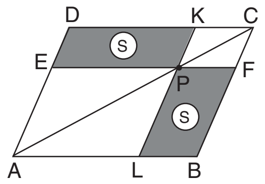


$\boxed{S_1 + S_3 = S_2 + S_4}$

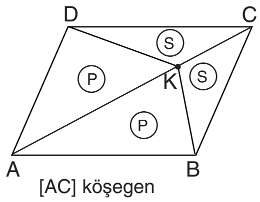


$\boxed{A(ABCD) = 2.A(DCE)}$

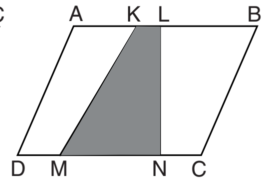




[AC] köşegen

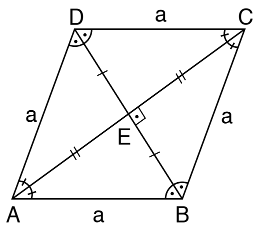


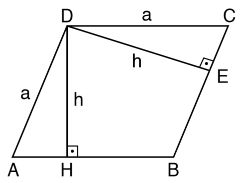
[AC] köşegen



$\dfrac{\text{Alan}(KLMN)}{\text{Alan}(ABCD)} = \dfrac{|KL| + |MN|}{2|AB|}$

EŞKENAR DÖRTGEN



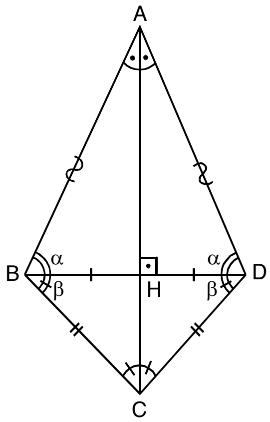


- Paralelkenarın tüm özelliklerini taşır.
- Köşegenler açıortay ve birbirine diktir.
- Yükseklikleri eşittir.
- $|BD| = e,\ |AC| = f\ ,\ |AB| = a$ ise

$\boxed{e^2 + f^2 = 4a^2}$ $\boxed{A(ABCD) = a.h}$

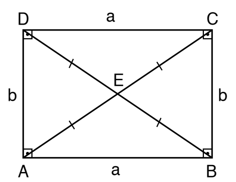
$\boxed{A(ABCD) = \dfrac{e.f}{2}}$

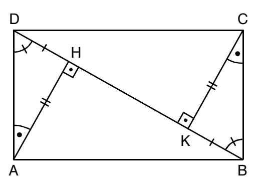
DELTOİD



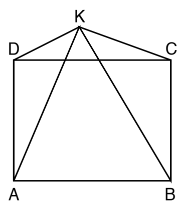
- $|AB| = |AD|$
- $|BC| = |CD|$
- $m(\widehat{ABC}) = m(\widehat{ADC})$
- [AC] açıortay köşegeni
- $[AC] \perp [BD]$
- $|BH| = |HD|$
- $\text{Alan}(ABCD) = \dfrac{|AC| \cdot |BD|}{2}$

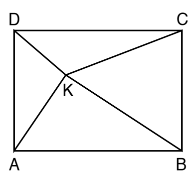
DİKDÖRTGEN





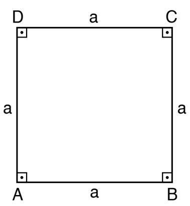
- Dikdörtgen, paralelkenarın tüm özelliklerini taşır.
- Köşegen uzunlukları eşit olup birbirini ortalar.
- $A(ABCD) = a.b$
-

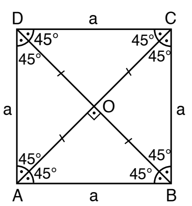




$|KD|^2 + |KB|^2 = |KA|^2 + |KC|^2$

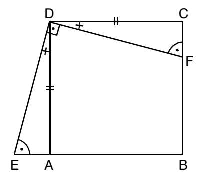
KARE

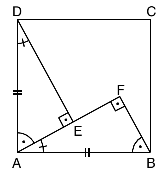


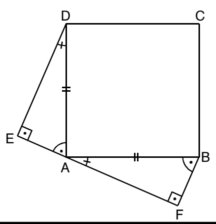


- Kare, paralelkenarın tüm özelliklerini taşır.
- Köşegen uzunlukları birbirine eşittir.
- Köşegenler birbirini ortalar.
- Köşegenler birbirine diktir.
- Köşegenler açıortaydır.
- $A(ABCD) = a^2$

Karede Eş Üçgenler



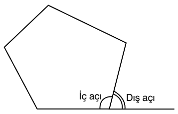




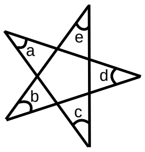
ÇOKGENLER

Konveks Çokgenlerin Özellikleri

1. İç açıların ölçüleri toplamı = **(n – 2) · 180°** dir.
2. Dış açıların ölçüleri toplamı = **360°** dir.



3. Köşegen sayısı = $\dfrac{\mathbf{n \cdot (n-3)}}{\mathbf{2}}$ dir.
4. Bir köşeden en fazla **(n – 3)** tane köşegen çizilebilir. Çizilen bu köşegenlerle **(n – 2)** tane üçgen oluşur.
5. n kenarlı bir çokgenin çizilebilmesi için en az 2n – 3 eleman verilmelidir. Bunlardan en az n – 2 tanesi uzunluk olmalıdır.
6.

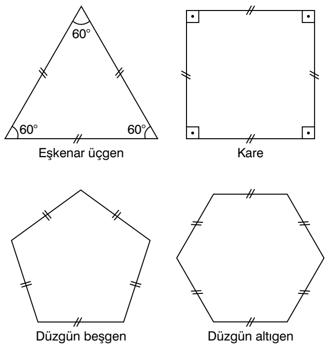


$\boxed{a+b+c+d+e = \mathbf{180°}}$

$\boxed{a+b+c+d+e+..... = \mathbf{(n-4).180°}}$

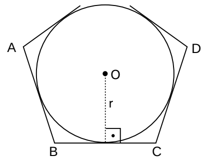
DÜZGÜN KONVEKS ÇOKGENLER

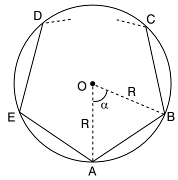
Tüm kenar uzunlukları ve iç açılarının ölçüleri eşit olan çokgenlere **düzgün çokgen** denir.



Düzgün Konveks Çokgenin Özellikleri

1. Bir dış açısının ölçüsü $= \dfrac{\mathbf{360°}}{\mathbf{n}}$ dir.
2. Bütün iç açılarının ölçüleri birbirine eşittir.
   Bütün dış açılarının ölçüleri birbirine eşittir.
3. Düzgün konveks çokgenlerin iç teğet çemberi ve çevrel çemberi vardır. Çevrel çemberin merkezi, iç teğet çemberinin merkezi ve ağırlık merkezi ortaktır.

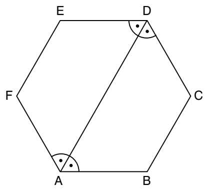




$\boxed{A(ABCD...) = n.\dfrac{a.r}{2}}$

$\boxed{A(...DEABC...) = n.\dfrac{1}{2}.R^2.\sin\alpha}$

4. Düzgün çokgenlerde kenar sayısı çift sayı ise karşılıklı kenarlar paraleldir. Karşılıklı iki köşeyi birleştiren köşegen açıortaydır.

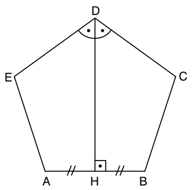


[ED] // [AB]

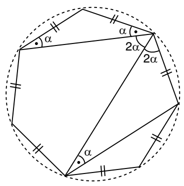
[EF] // [BC]

[AF] // [CD]

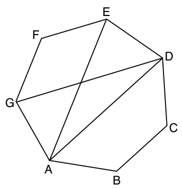
5. Düzgün çokgenlerde kenar sayısı tek sayı ise bir köşeden karşı kenara çizilen dikme hem kenarortay hem de açıortaydır. (Simetri ekseni)



6. Düzgün çokgenlerde eşit uzunlukta veya eşit sayıda kirişleri gören çevre açıların ölçüleri birbirine eşittir.

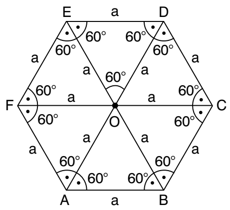


7. Düzgün çokgenlerde aynı sayıda köşeleri birleştiren köşegenlerin uzunlukları eşittir.



|GD| = |AE| = |AD|

DÜZGÜN ALTIGEN



|AD| = |BE| = |FC| = 2a

Karşılıklı köşeleri birleştiren köşegenler çizildiğinde; [AD], [BE], [FC]

✳ Bu köşegenler açıortay olur ve uzunlukları birbirine eşittir.

✳ Bu köşegenlerin her biri düzgün altıgeni iki tane eş ikizkenar yamuğa ayırır.

✳ 6 adet eşkenar üçgen oluşur.

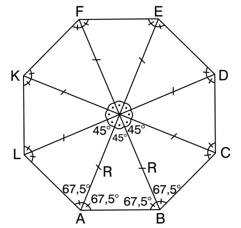
$$A(ABCDEF) = 6 \cdot \frac{a^2\sqrt{3}}{4}$$

✳ Düzgün altıgenin bir iç açısı 120° ve bir dış açısı 60° dir.

✳ Düzgün altıgenin kenar sayısı çift sayı olduğundan karşılıklı kenarlar paraleldir.

✳ O noktası; düzgün altıgenin iç teğet çemberinin merkezi, çevrel çemberinin merkezi ve aynı zamanda ağırlık merkezidir.

DÜZGÜN SEKİZGEN

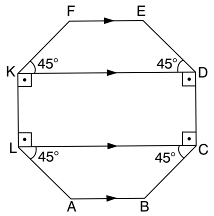


✳ Karşılıklı kenarlar paraleldir.

✳ Karşılıklı köşeleri birleştiren köşegenler, açıortaydır ve uzunlukları birbirine eşittir.

✳ Bu köşegenler düzgün sekizgenin merkezinden geçer ve düzgün sekizgeni 8 adet eş üçgene ayırır.

Oluşan her bir üçgenin alanı $\dfrac{1}{2}$ R.R.Sin45° dir.



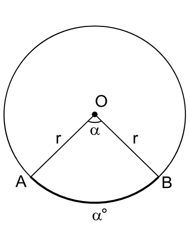
LCDK dikdörtgen

ABCL ve KDEF

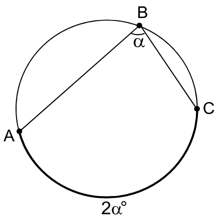
İkizkenar yamuk olur.

Çemberde Açılar

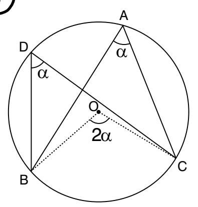
1 **Merkez Açı**



2 **Çevre Açı**

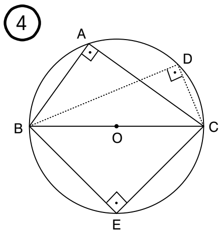


3



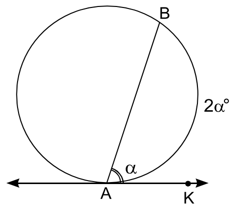
Aynı yayları gören çevre açıların ölçüleri birbirine eşittir.

4

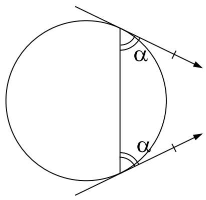


Çapı gören çevre açı 90° dir.

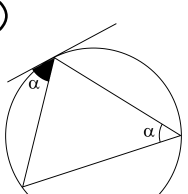
5 **Teğet – Kiriş Açı**



6

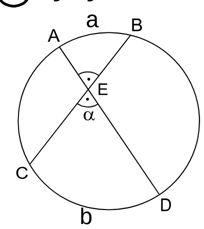


7



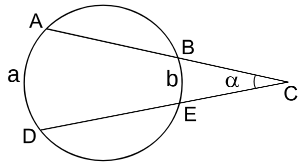
Aynı yayı gören çevre açı ile teğet - kiriş açının ölçüsü birbirine eşittir.

8 **İç Açı**

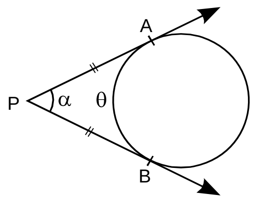


$$\boxed{\alpha = \frac{a+b}{2}}$$

9 **Dış Açı**

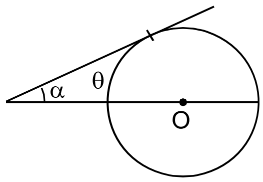


$$\boxed{\alpha = \frac{a-b}{2}}$$



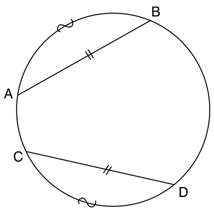
$\boxed{\alpha + \theta = 180°}$

$\boxed{|PA| = |PB|}$

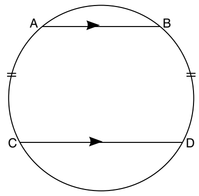


$\boxed{\alpha + \theta = 90°}$

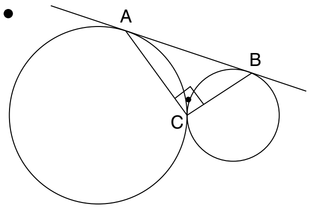
- Eşit uzunluktaki kirişler çemberden eş yaylar ayırır.



- Paralel iki kiriş arasında kalan yayların ölçüleri birbirine eşittir.

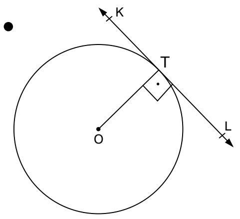


-



$\boxed{m(\widehat{ACB}) = 90°}$

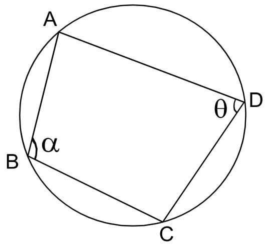
-



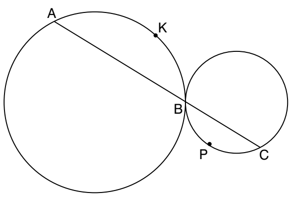
O merkez

$\boxed{[OT] \perp KL}$

Kirişler Dörtgeni

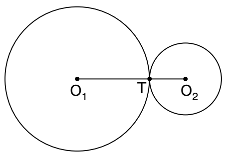


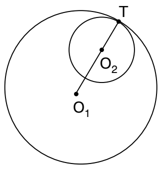
$\boxed{\alpha + \theta = 180°}$



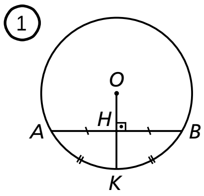
$m(\overset{\frown}{AKB}) = m(\overset{\frown}{BPC})$

Çemberlerin merkezleri ve teget noktalar dogrusaldir.



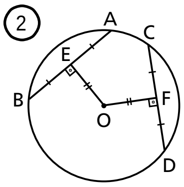


ÇEMBERDE UZUNLUK

1


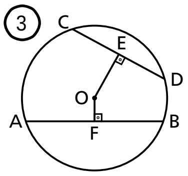
[OK] ⊥ [AB] ise

|AH| = |HB|

2


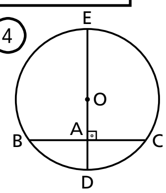
|OE| = |OF| *ise*

|AB| = |CD|

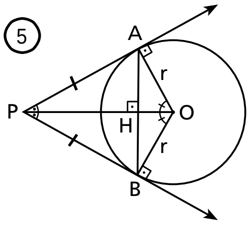
3


|OF| < |OE| *ise*

|AB| > |CD|

4


A noktasından geçen
en uzun kiriş [DE],
en kısa kiriş i [BC]

5


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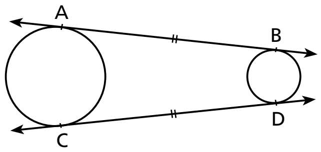
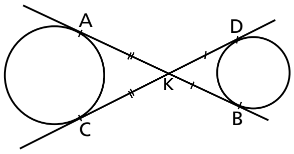
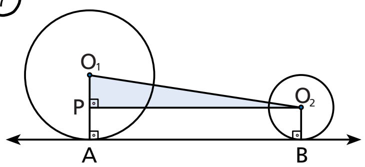
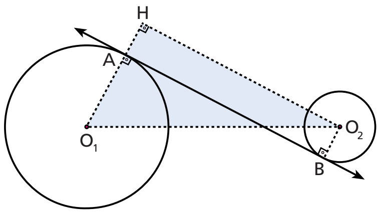
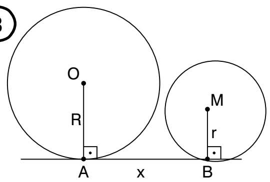




|AB| = |CD|

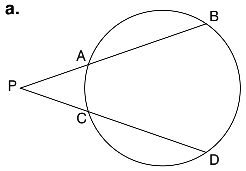
7




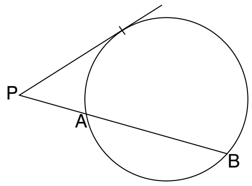
8


$|AB| = x = 2\sqrt{R \cdot r}$

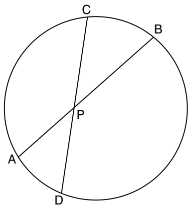
9 **Bir noktanın çembere göre kuvveti**

a.


$|PA| \cdot |PB| = |PC| \cdot |PD|$

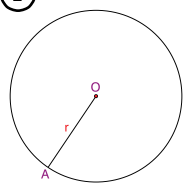
b.


$|PT|^2 = |PA| \cdot |PB|$

c.


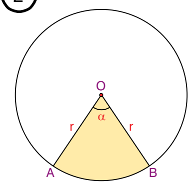
$|PA| \cdot |PB| = |PC| \cdot |PD|$

DAiREDE ALAN

1


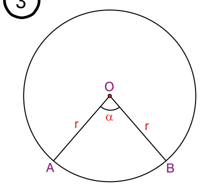
Dairenin Alanı $= \pi r^2$

Dairenin Çevresi $= 2\pi r$

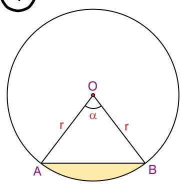
2


Taralı Alan $= \dfrac{\pi r^2 \cdot \alpha}{360°}$

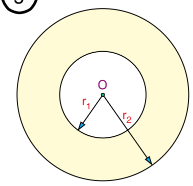
Taralı Alan $= \dfrac{r \cdot |\overset{\frown}{AB}|}{2}$

3


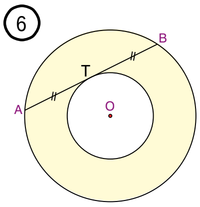
$|\overset{\frown}{AB}| = \dfrac{2\pi r \cdot \alpha}{360°}$

4


Taralı Alan $= \dfrac{\pi r^2 \cdot \alpha}{360°} - \dfrac{r^2}{2} \cdot \sin\alpha$

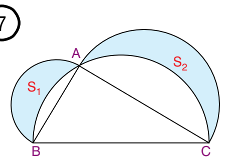
5


Taralı Alan $= \pi r_2^2 - \pi r_1^2$

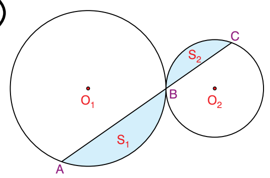
6


$|AT| = |BT|$

Taralı Alan $= \dfrac{\pi \cdot |AT|^2}{4}$

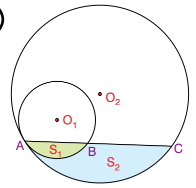
7


$A(ABC) = S_1 + S_2$

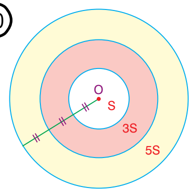
8


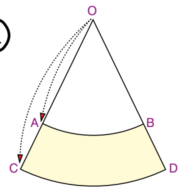
Benzerlik oranı $= \dfrac{r_1}{r_2} = \dfrac{|AB|}{|BC|} = \dfrac{|\overset{\frown}{AB}|}{|\overset{\frown}{BC}|}$ dir.

Alan oranı ise benzerlik oranının karesine eşittir.

9


Benzerlik oranı $= \dfrac{r_1}{r_2} = \dfrac{|AB|}{|AC|} = \dfrac{|\overset{\frown}{AB}|}{|\overset{\frown}{AC}|}$

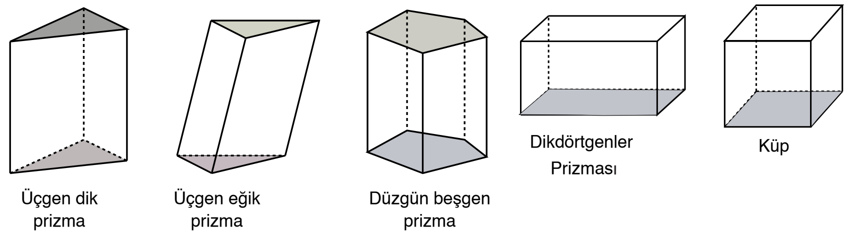
10


11


$\dfrac{|OA|}{|OC|} = \dfrac{|OB|}{|OD|} = \dfrac{|\overset{\frown}{AB}|}{|\overset{\frown}{CD}|}$

Taralı Alan $= \dfrac{(|\overset{\frown}{AB}| + |\overset{\frown}{CD}|) \cdot |BD|}{2}$

PRİZMALAR

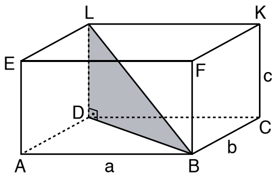


Yanal alan = Taban çevresi x yükseklik

Bütün alan = Yanal alan + 2.Taban alanı

Hacim = Taban alanı x Yükseklik

DİKDÖRTGENLER PRİZMASI



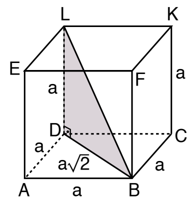
Cisim köşegeni $|LB| = \sqrt{a^2+b^2+c^2}$

Yanal alan= 2(a + b).c

Bütün alan= 2(ab + ac + bc)

V = a.b.c

KÜP



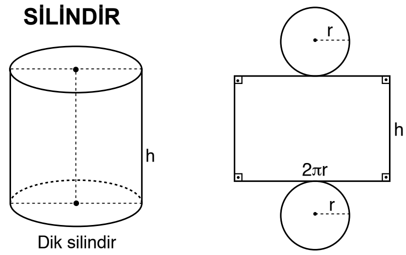
Yüzey köşegeni $= a\sqrt{2}$

Cisim köşegeni $= a\sqrt{3}$

$A = 6.a^2$

$V = a^2.a = a^3$

SİLİNDİR



Yanal Alan = Taban çevresi x Yükseklik $= 2\pi rh$

Alan = Yanal alan + 2.Taban alanı

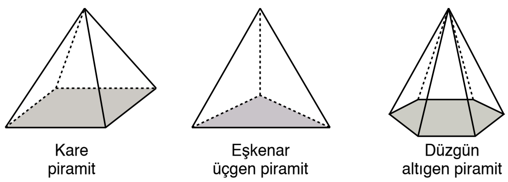
$S = 2\pi rh + 2.\pi r^2 = 2\pi r(h+r)$

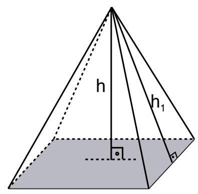
Hacim = Taban alanı x Yükseklik

$V = \pi r^2 h$

PİRAMİT

Düzgün Piramit



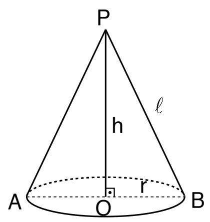


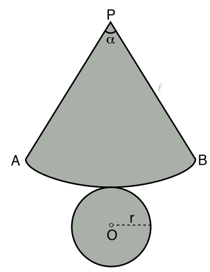
$Y.A = \dfrac{\text{Taban çevresi x Yan yüz yüksekliği}}{2}$

Bütün alan = Yanal alan + Taban alanı

$V = \dfrac{1}{3}$ Taban Alanı x Yükseklik

KONİ



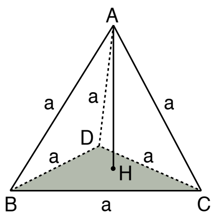


$\text{Alan} = \pi r\ell + \pi r^2$

$V = \dfrac{1}{3}\pi r^2 h$

$\dfrac{r}{\ell} = \dfrac{\alpha}{360°}$

DÜZGÜN DÖRTYÜZLÜ

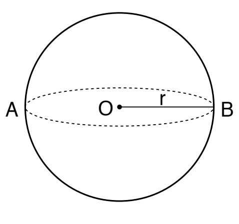


$|AH| = \dfrac{a\sqrt{6}}{3}$

$\text{Alan} = a^2\sqrt{3}$

$V = \dfrac{a^3\sqrt{2}}{12}$

KÜRE



$A = 4\pi r^2$

$V = \dfrac{4}{3}\pi r^3$