

# *Paraboller*

*2024 AYT Matematik*

*ODTÜ'LÜ HOCAM*

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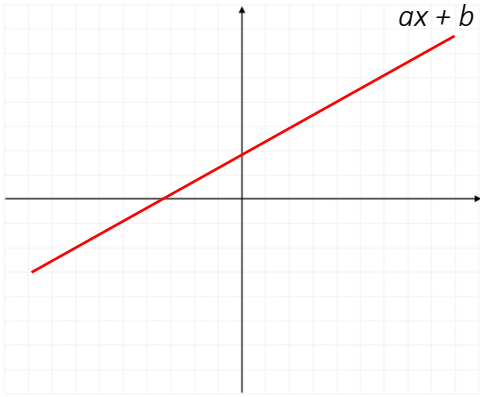
# ***Konu Listesi :***

# Parabollerin Tanımı

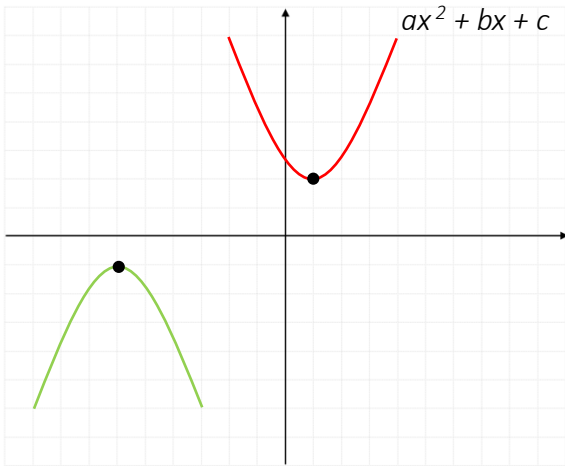
I . Dereceden Fonksiyon  $\rightarrow ax + b$

II . Dereceden Fonksiyon  $\rightarrow ax^2 + bx + c$

Doğrusal fonksiyon grafiği ( Liner ) :

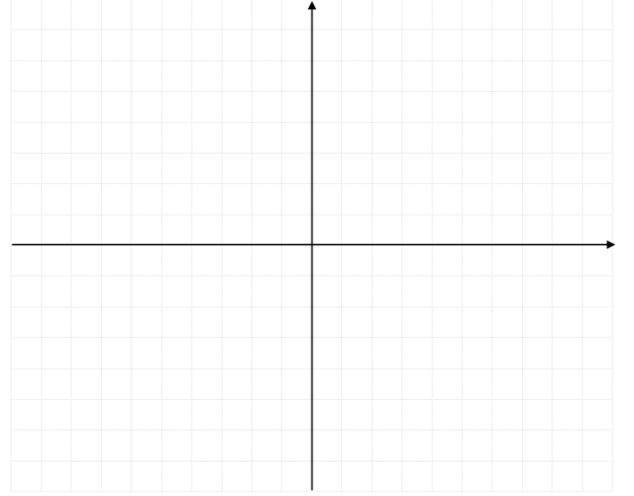


2.derece fonksiyon grafiği ( Parabol ) :

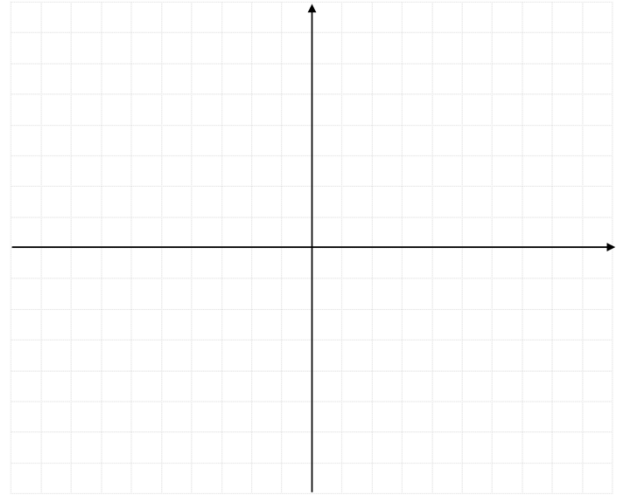


Örnek

$$f(x) = x + 3$$



$$f(x) = x^2 - 4x + 4$$



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**Paraboller**

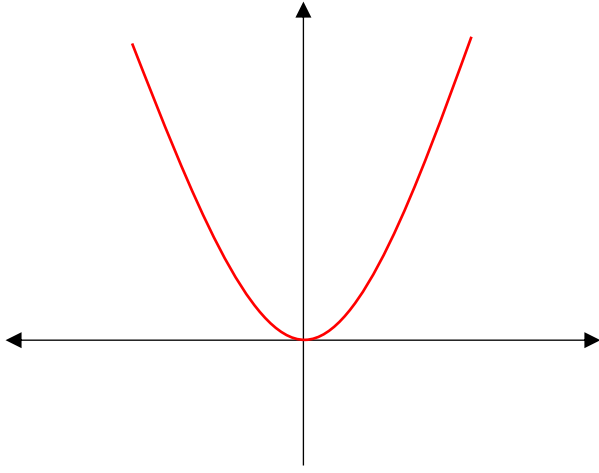
$$f(x) = a.(x \pm b)^2 \pm c$$

$$f(x) = ax^2 + bx + c$$

# Parabollere Giriş

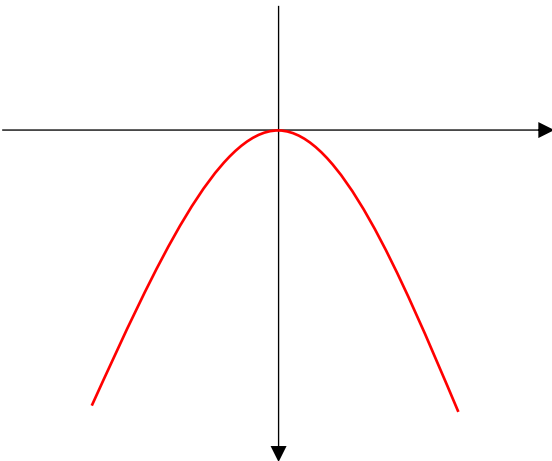
$$f(x) = x^2$$

$f(x) = x^2$  parabolünün grafiğini çiziniz .



$$f(x) = -x^2$$

$f(x) = -x^2$  parabolünün grafiğini çiziniz .



$$f(x) = x^2$$

Daraltma

$$f(x) = ax^2$$

Genişletme

$$f(x) = \frac{x^2}{a}$$

Dikey Öteleme

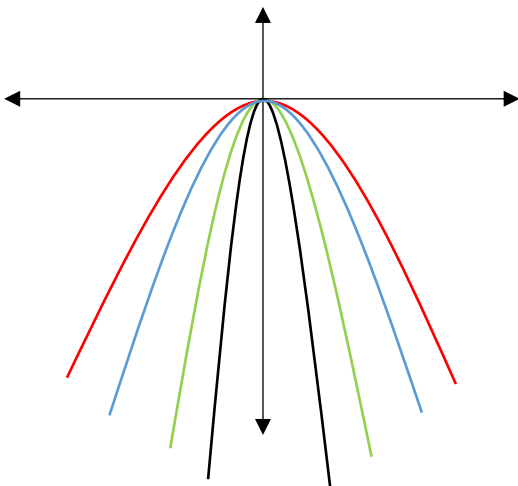
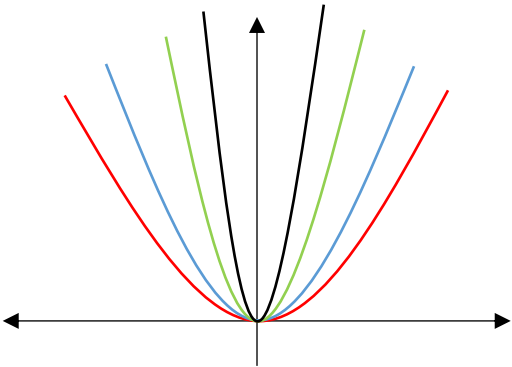
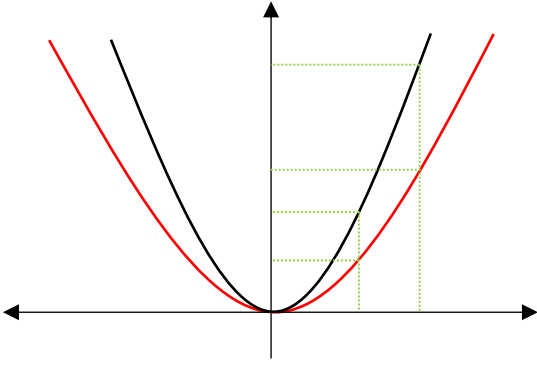
$$f(x) = x^2 \pm a$$

Yatay Öteleme

$$f(x) = (x \pm a)^2$$

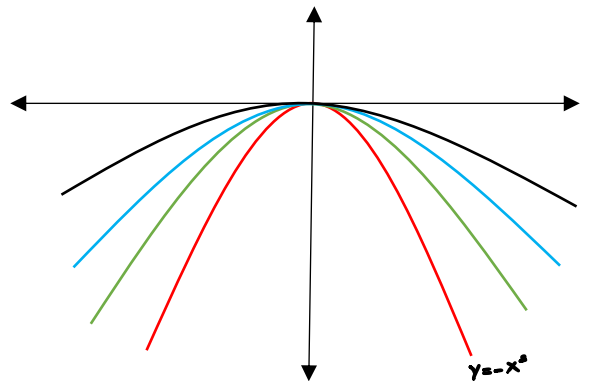
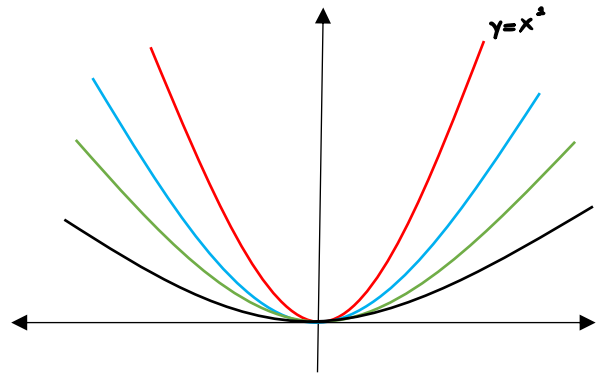
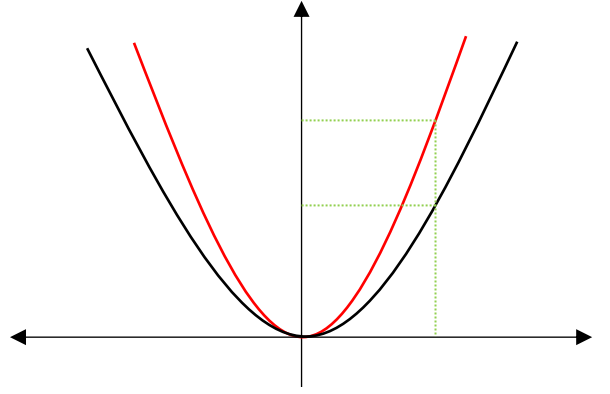
## Daraltma

$$f(x) = ax^2$$



## Genişletme

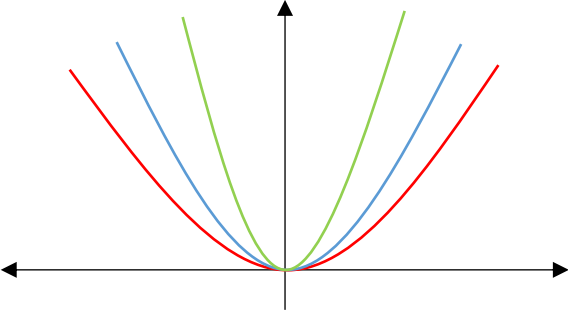
$$f(x) = \frac{x^2}{a}$$



**Soru 1**

Aşağıda verilen parabolleri doğru grafiklerle eşleştiriniz .

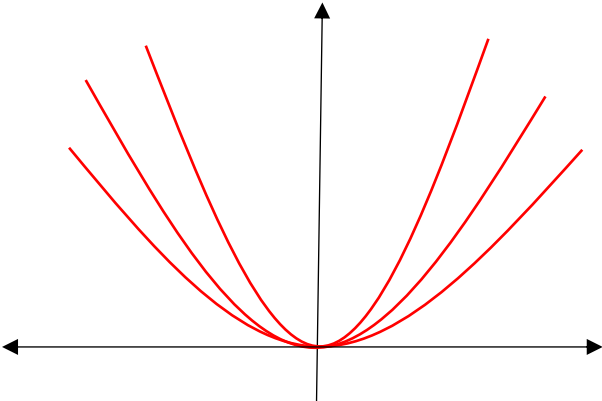
$$f(x) = 3x^2 \quad g(x) = 5x^2 \quad h(x) = x^2$$

**Soru 2**

Aşağıda verilen parabolleri doğru grafiklerle eşleştiriniz .

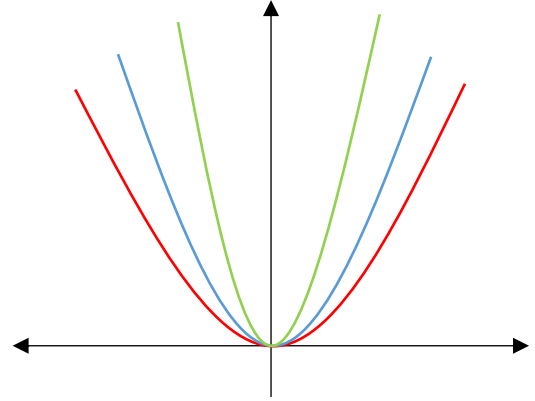
$$f(x) = \frac{1}{5}x^2 \quad g(x) = \frac{x^2}{3}$$

$$h(x) = \frac{1}{7}x^2$$

**Soru 3**

Aşağıda verilen parabolleri doğru grafiklerle eşleştiriniz .

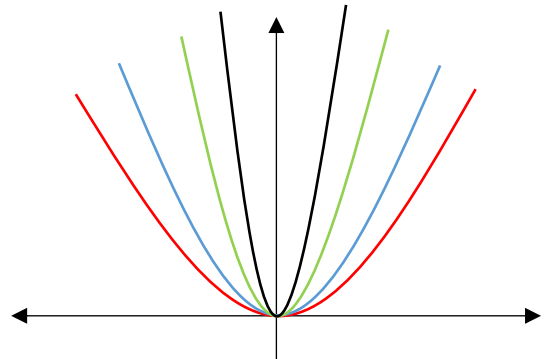
$$f(x) = \frac{1}{4}x^2 \quad g(x) = 6x^2 \quad h(x) = 2x^2$$

**Soru 4**

Aşağıda verilen parabolleri doğru grafiklerle eşleştiriniz .

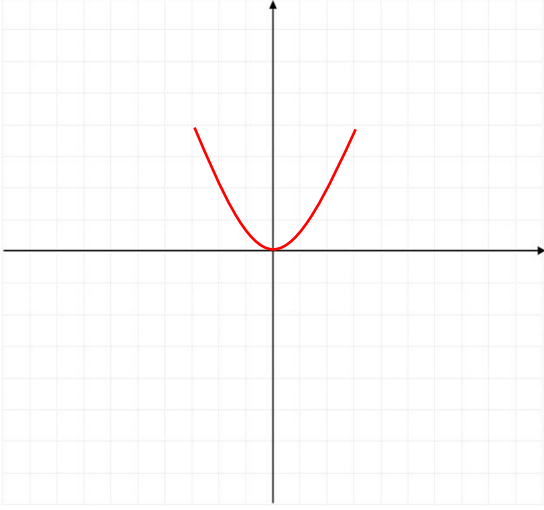
$$f(x) = x^2 \quad g(x) = \frac{1}{5}x^2$$

$$h(x) = 5x^2 \quad p(x) = \frac{x^2}{3}$$



## Dikey Eksende Öteleme

$$f(x) = x^2 \pm a$$

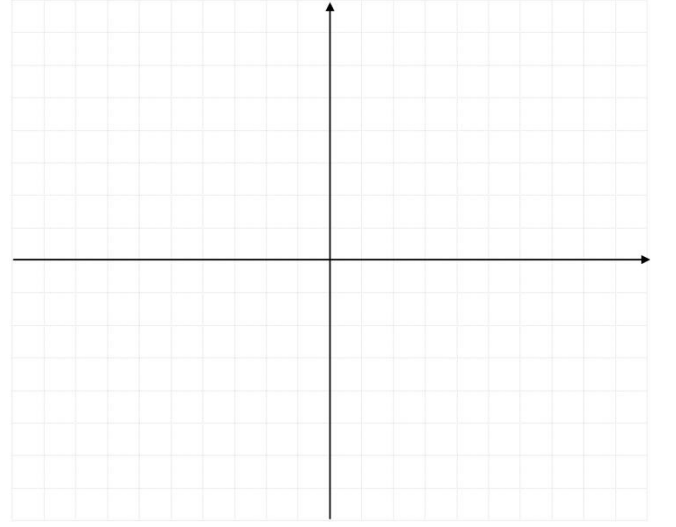


### Soru 1

Aşağıda verilen parabollerin grafiklerini çizin .

$$f(x) = x^2 + 5$$

$$g(x) = x^2 - 4$$

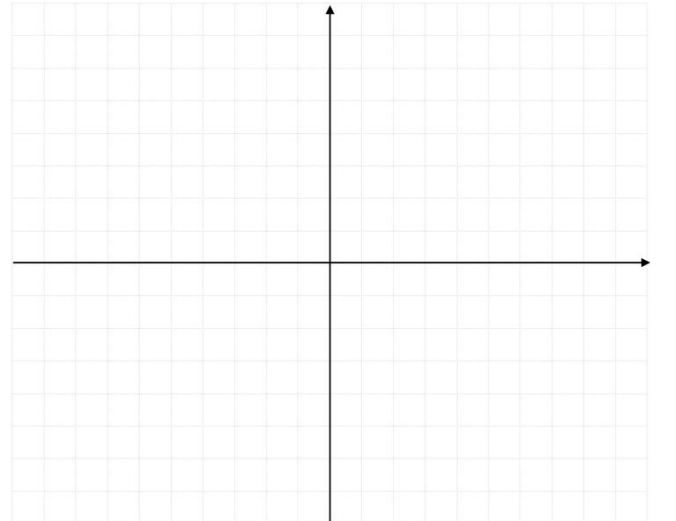


### Soru 2

Aşağıda verilen parabollerin grafiklerini çizin .

$$f(x) = -x^2 + 3$$

$$g(x) = -x^2 - 5$$



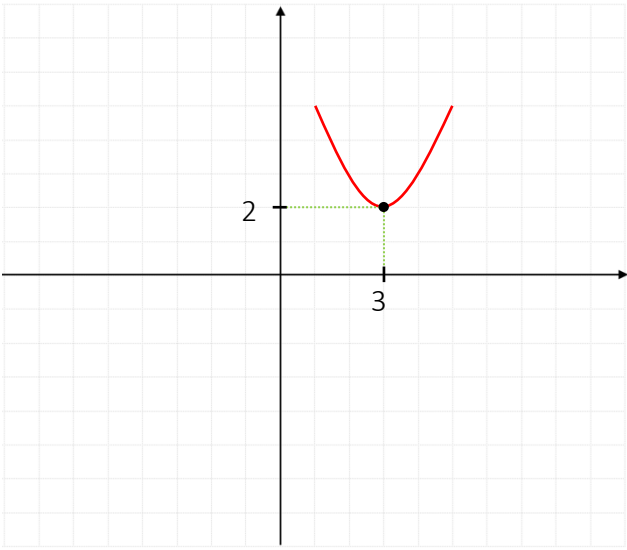
**Soru 3**

Şekilde  $f(x)$  parabolünün grafiği ve tepe noktası verilmiştir . Buna göre , aşağıda verilen parabollerin grafiklerini çiziniz :

I .  $f(x) + 3$

II .  $f(x) - 4$

III .  $-f(x) - 6$

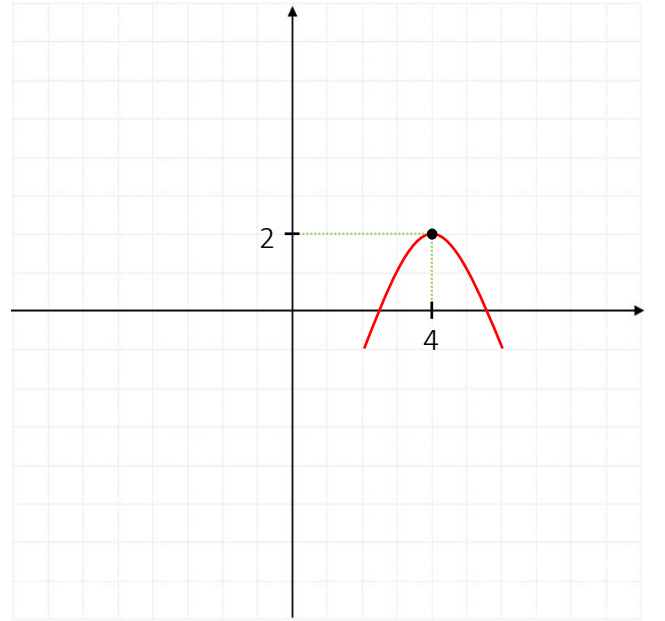
**Soru 4**

Şekilde  $f(x)$  parabolünün grafiği ve tepe noktası verilmiştir . Buna göre , aşağıda verilen parabollerin grafiklerini çiziniz :

I .  $f(x) + 2$

II .  $f(x) - 5$

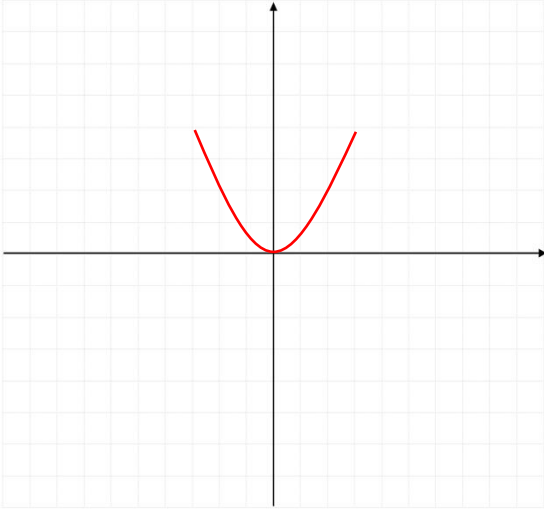
III .  $-f(x) - 8$





## Yatay Eksende Öteleme

$$f(x) = (x \pm a)^2$$

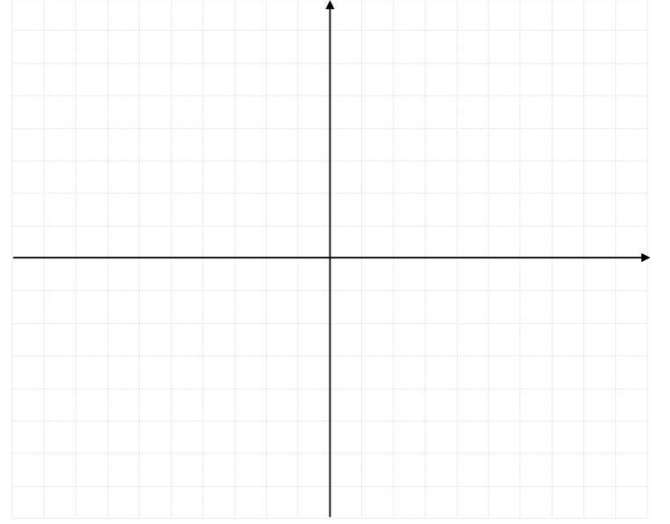


### Soru 1

Aşağıda verilen parabollerin grafiklerini çizin .

$$f(x) = (x - 3)^2$$

$$g(x) = (x + 4)^2$$

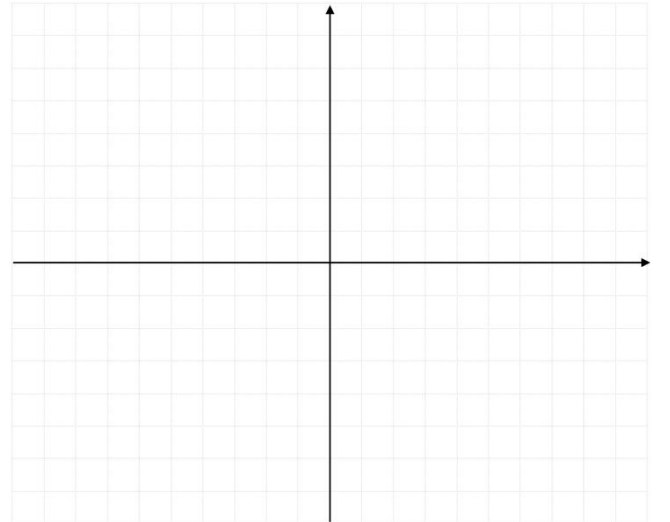


### Soru 2

Aşağıda verilen parabollerin grafiklerini çizin .

$$f(x) = (-x + 4)^2$$

$$g(x) = -(x + 4)^2$$

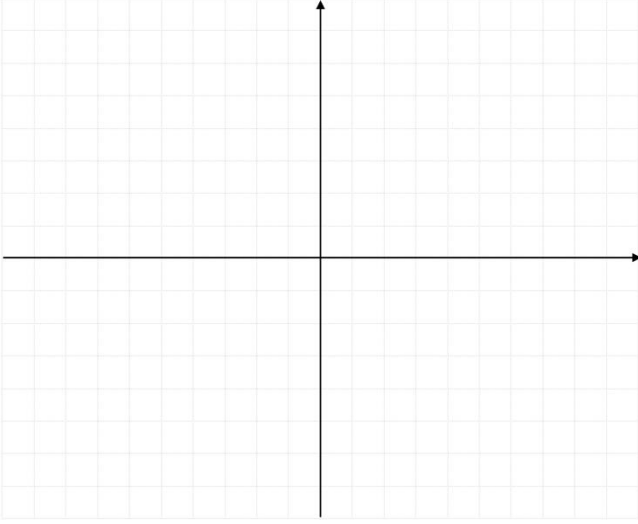


**Soru 3**

Aşağıda verilen parabollerin grafiklerini çiziniz .

$$f(x) = (-x + 5)^2$$

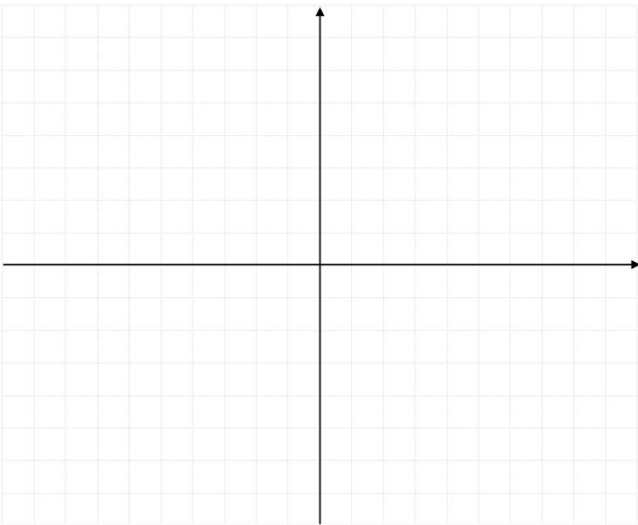
$$g(x) = -(x - 5)^2$$

**Soru 4**

Aşağıda verilen parabollerin grafiklerini çiziniz .

$$f(x) = 2.(x - 5)^2$$

$$g(x) = -3.(x + 6)^2$$

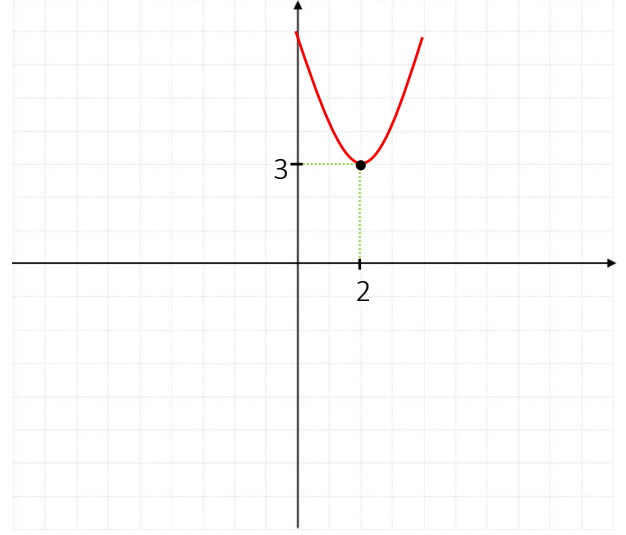
**Soru 5**

Şekilde  $f(x)$  parabolünün grafiği ve tepe noktası verilmiştir . Buna göre , aşağıda verilen parabollerin grafiklerini çiziniz :

I .  $f(x + 5)$

II .  $f(x - 6)$

III .  $-f(x + 8)$

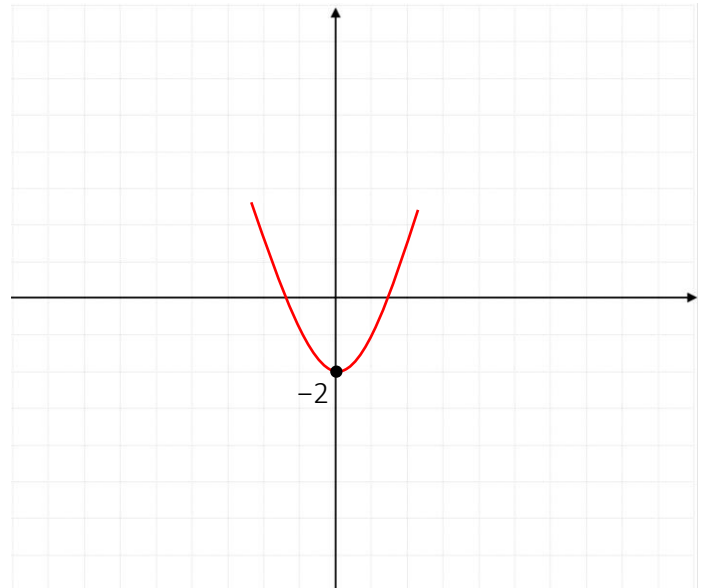
**Soru 6**

Şekilde  $f(x)$  parabolünün grafiği ve tepe noktası verilmiştir . Buna göre , aşağıda verilen parabollerin grafiklerini çiziniz :

I .  $f(x + 5)$

II .  $f(x - 7)$

III .  $-f(x + 3)$



## Parabollerde Grafik Çizme

### Paraboller

$$f(x) = a.(x \pm b)^2 \pm c$$

$$f(x) = ax^2 + bx + c$$

$$f(x) = a.(x \pm b)^2 \pm c$$

$2.(x-5)^2 + 3$

**Daraltma**  
**Genişletme**

**Yatay**  
**öteleme**

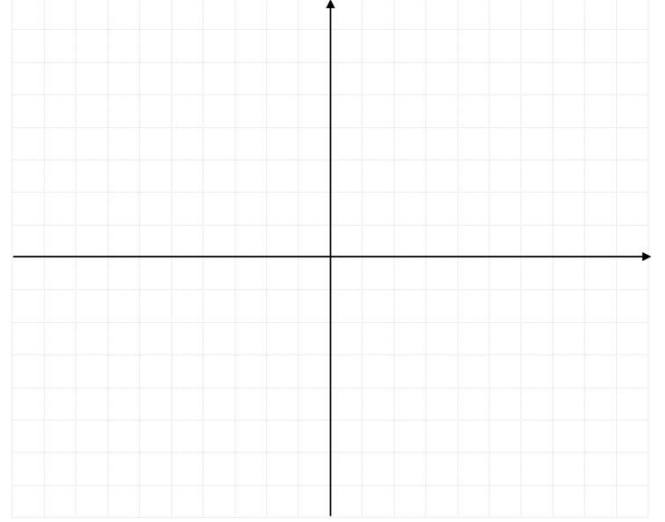
**Dikey**  
**öteleme**

### Soru 1

$$f(x) = a.(x \pm b)^2 \pm c$$

Aşağıda verilen parabolün grafiğini çiziniz .

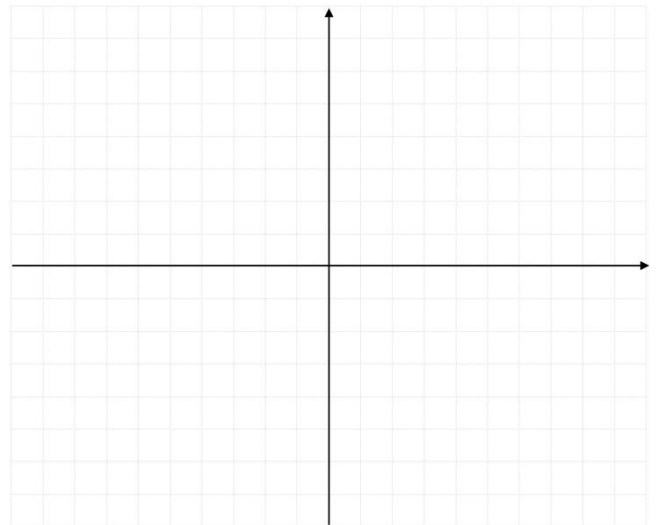
$$f(x) = (x - 5)^2 + 3$$



### Soru 2

Aşağıda verilen parabolün grafiğini çiziniz ve y eksenini keşiği noktayı bulunuz .

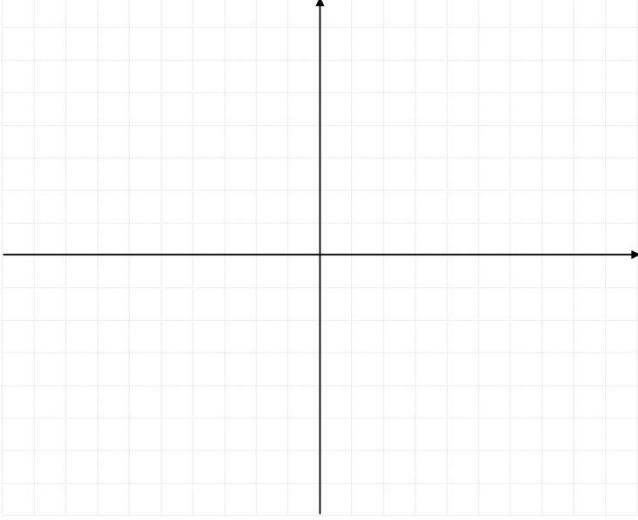
$$f(x) = (x - 6)^2 - 4$$



**Soru 3**

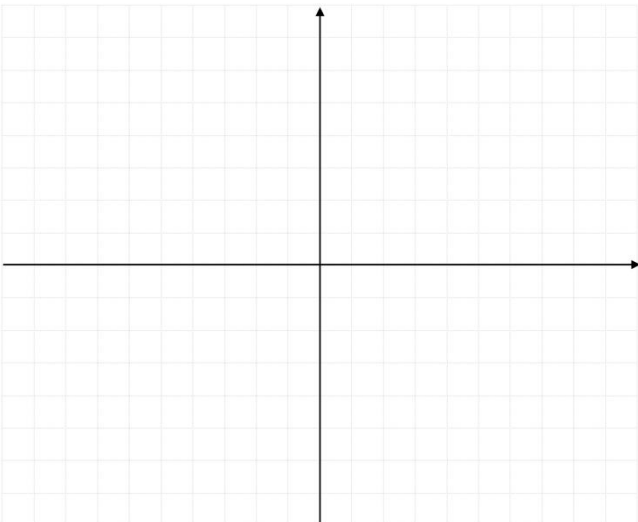
Aşağıda verilen parabolün grafiğini çiziniz ve y eksenini kestiği noktayı bulunuz .

$$f(x) = -(x + 6)^2 + 3$$

**Soru 4**

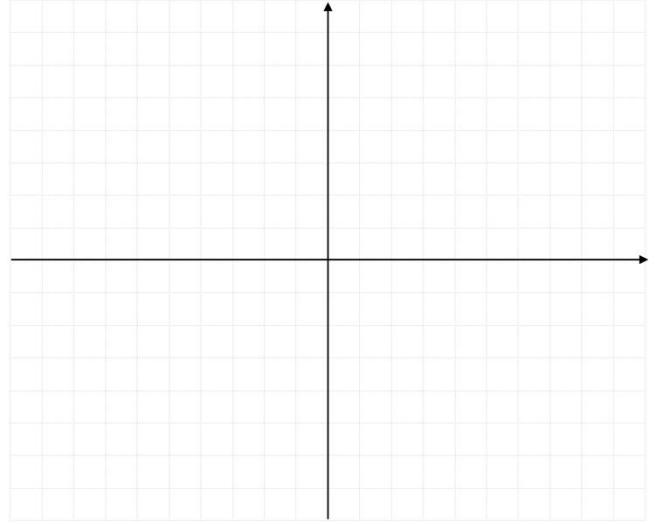
Aşağıda verilen parabolün grafiğini çiziniz ve y eksenini kestiği noktayı bulunuz .

$$f(x) = -2.(x - 5)^2 + 6$$

**Soru 5**

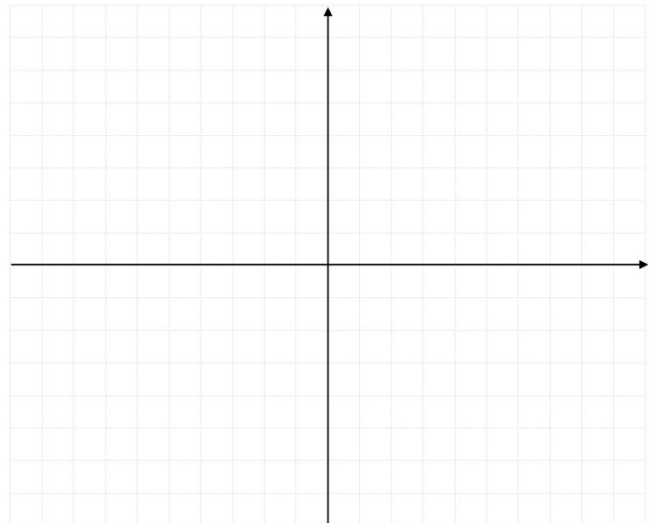
Aşağıda verilen parabolün grafiğini çizip y eksenini kestiği noktayı bulunuz .

$$f(x) = (x + 1)^2 + 2$$

**Soru 6**

Aşağıda verilen parabolün grafiğini çizip y eksenini kestiği noktayı bulunuz .

$$f(x) = -2.(x - 1)^2 + 3$$



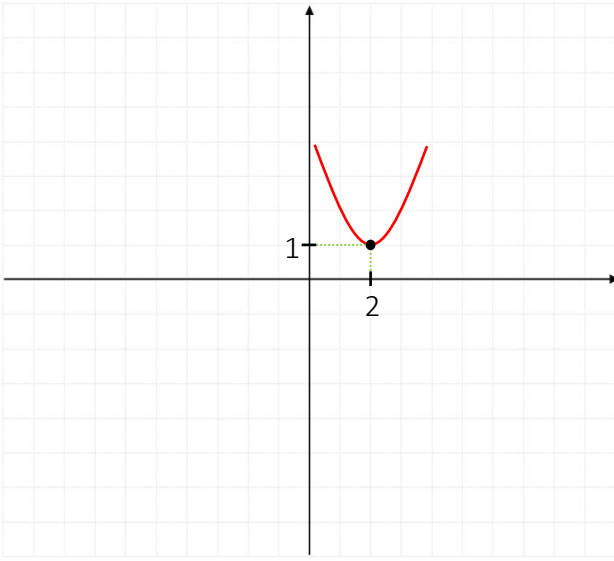
**Soru 7**

Şekilde  $f(x)$  parabolünün grafiği verilmiştir .  
Buna göre aşağıda verilen öteleme işlemlerini yapınız .

*I* .  $f(x+8)+2$

*II* .  $f(x-4)-5$

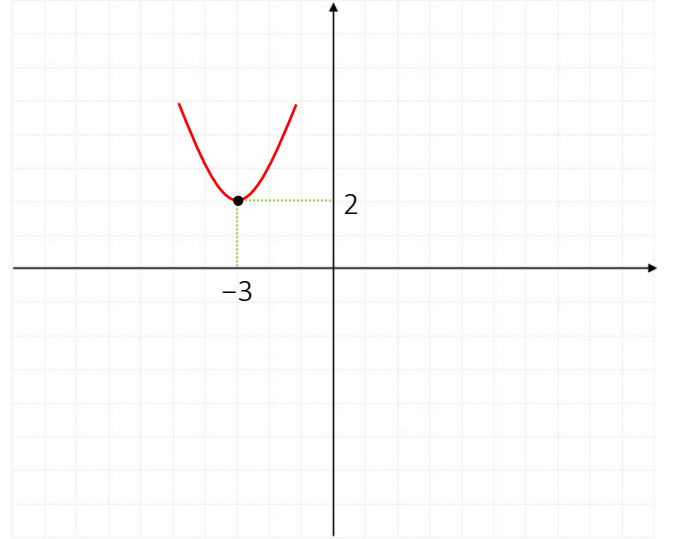
*III* .  $-f(x+5)-4$

**Soru 8**

Şekilde  $f(x)$  parabolünün grafiği verilmiştir .  
Buna göre aşağıda verilen parabollerin grafiklerini çiziniz .

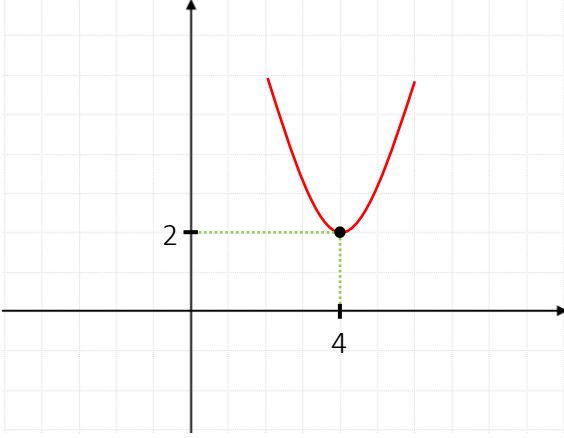
$g(x) = f(x-8)+2$

$h(x) = -f(x+3)-6$



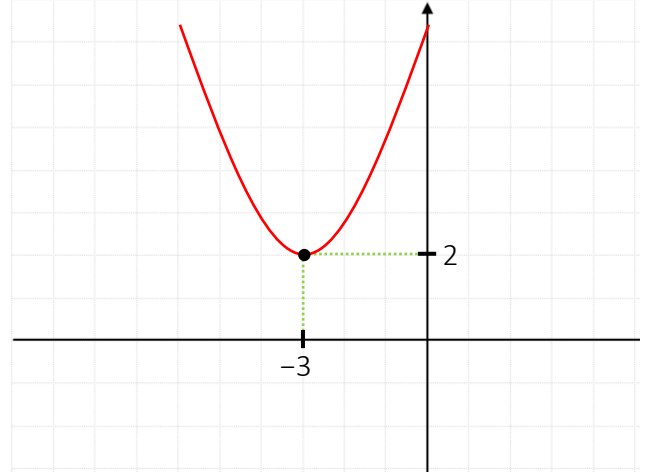
## Grafiđi Verilen Parabolün Denklemi Bulma

### Örnek



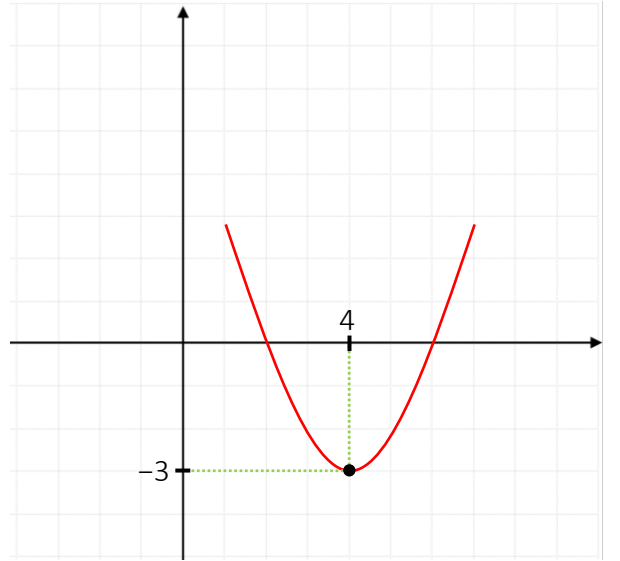
### Soru 1

Aşğıda grafiđi verilen parabolün denklemini bulunuz.



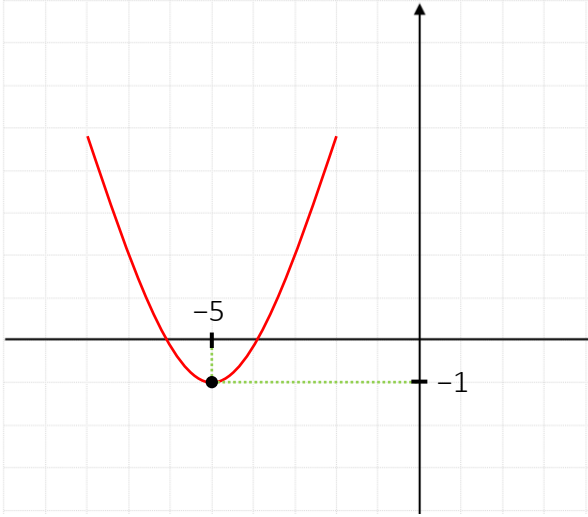
### Soru 2

Aşğıda grafiđi verilen parabolün denklemini bulunuz.

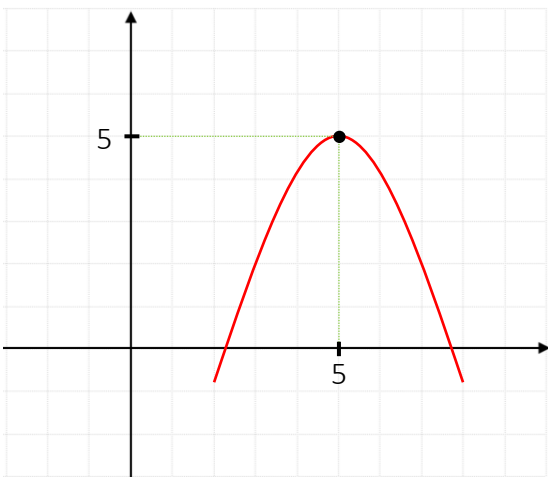


**Soru 3**

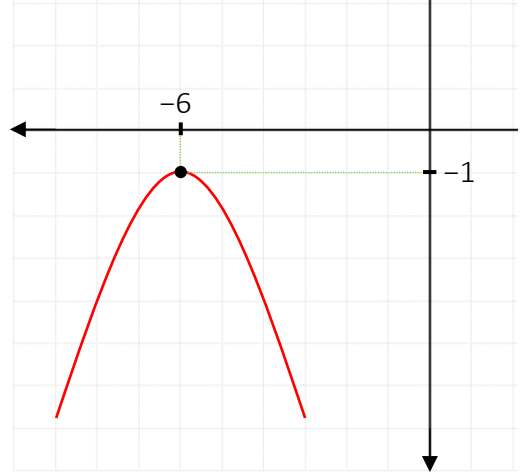
Aşağıda grafiği verilen parabolün denklemini bulunuz.

**Soru 4**

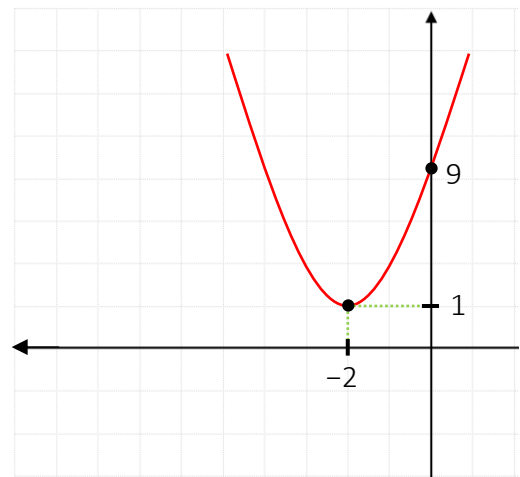
Aşağıda grafiği verilen parabolün denklemini bulunuz.

**Soru 5**

Aşağıda grafiği verilen parabolün denklemini bulunuz.

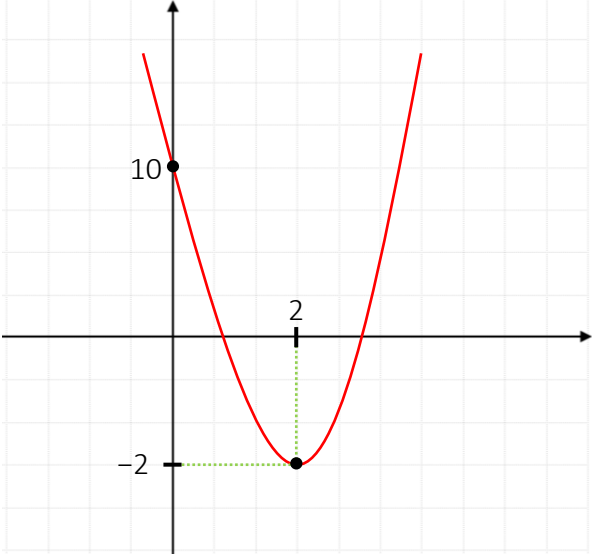
**Soru 6**

Aşağıda grafiği verilen parabolün denklemini bulunuz.

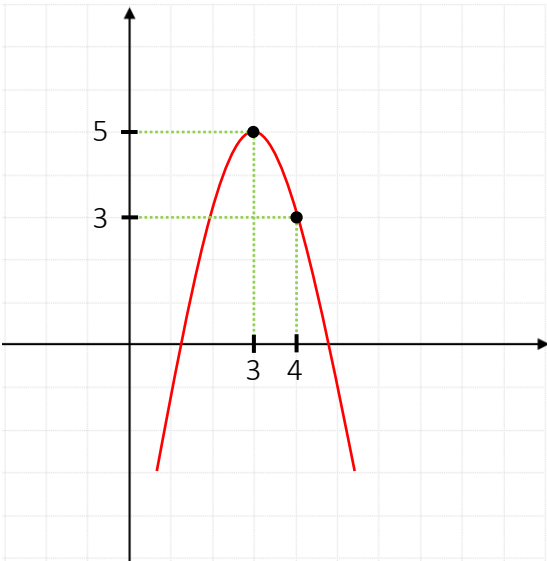


**Soru 7**

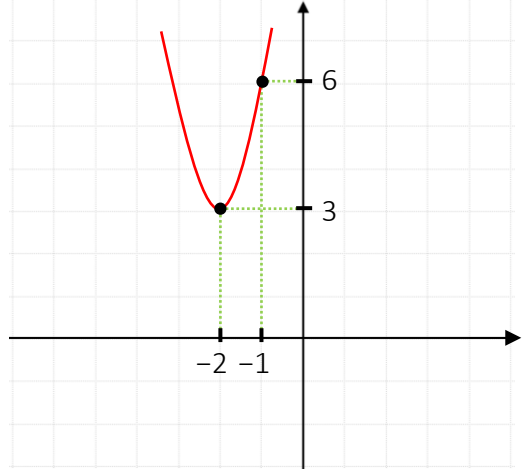
Aşağıda grafiği verilen parabolün denklemini bulunuz.

**Soru 8**

Aşağıda grafiği verilen parabolün denklemini bulunuz.

**Soru 9**

Aşağıda grafiği verilen parabolün denklemini bulunuz.



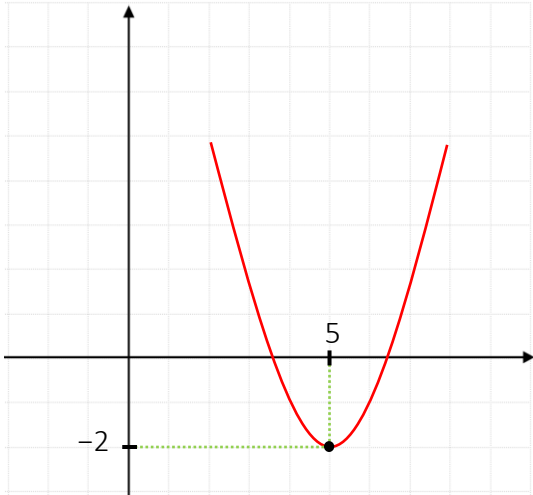
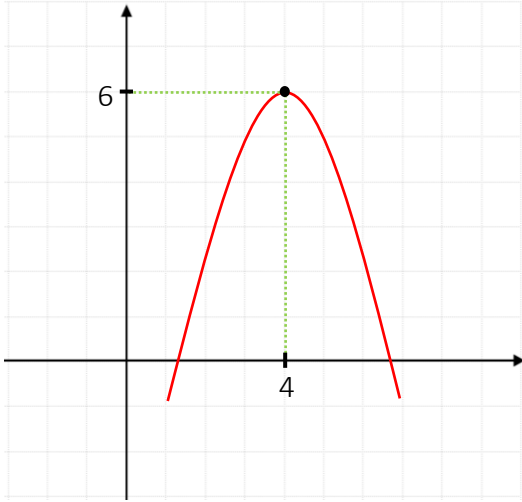


## Paraboller

$$f(x) = a.(x \pm b)^2 \pm c$$

$$f(x) = ax^2 + bx + c$$

## Tepe Noktası

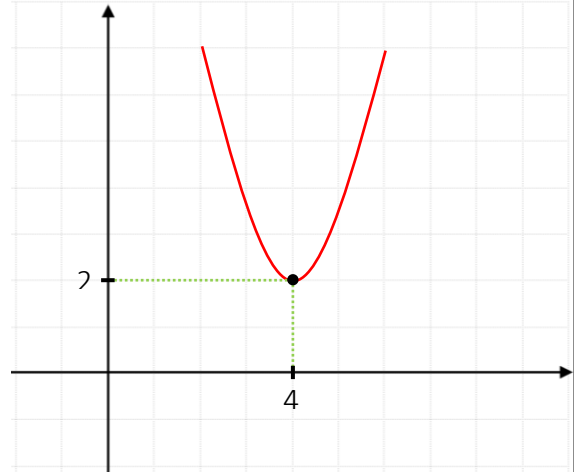


$$f(x) = a.(x \pm b)^2 \pm c$$

$$f(x) = a.(x - r)^2 + k$$

## Örnek

$$f(x) = 3.(x - 4)^2 + 2$$



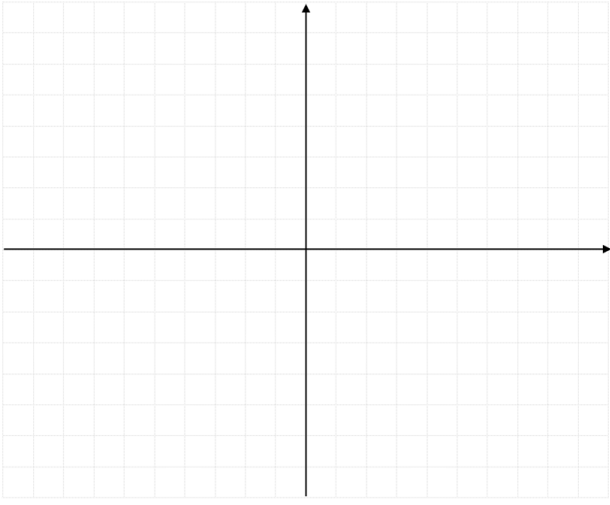
### Örnek

$$f(x) = 2.(x-3)^2 + 5 \rightarrow T(\dots, \dots)$$

$$f(x) = -3.(x+4)^2 + 2 \rightarrow T(\dots, \dots)$$

$$f(x) = -(x+5)^2 - 6 \rightarrow T(\dots, \dots)$$

$$f(x) = (x-7)^2 + 3 \rightarrow T(\dots, \dots)$$



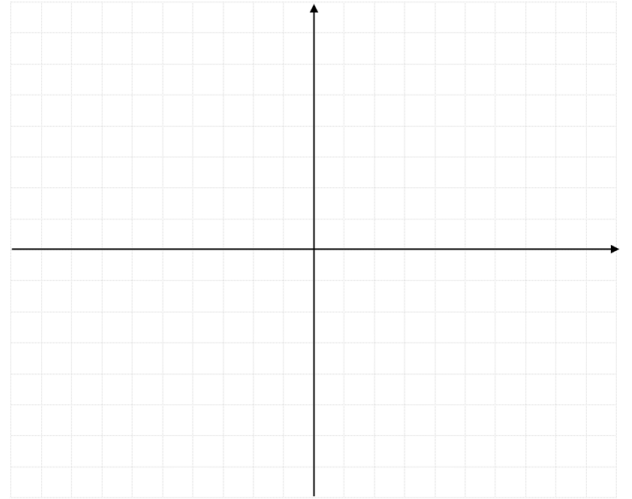
$$f(x) = ax^2 + bx + c$$

$$T(r, k) \quad r = -\frac{b}{2a} \quad k = f(r)$$

### Örnek

Aşağıda verilen parabollerin tepe noktasını bulunuz .

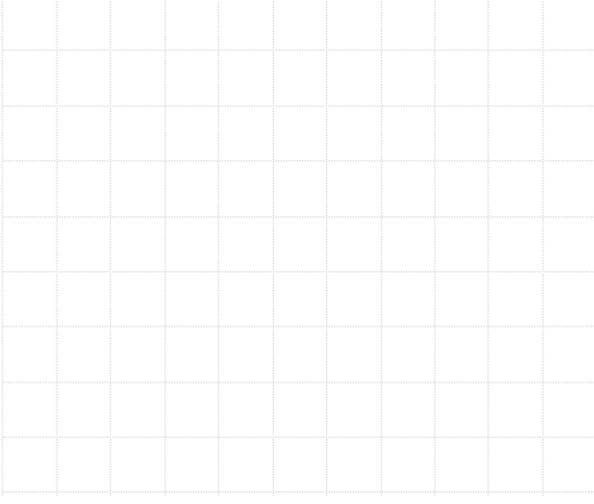
$$f(x) = 2x^2 + 8x + 10$$



**Örnek**

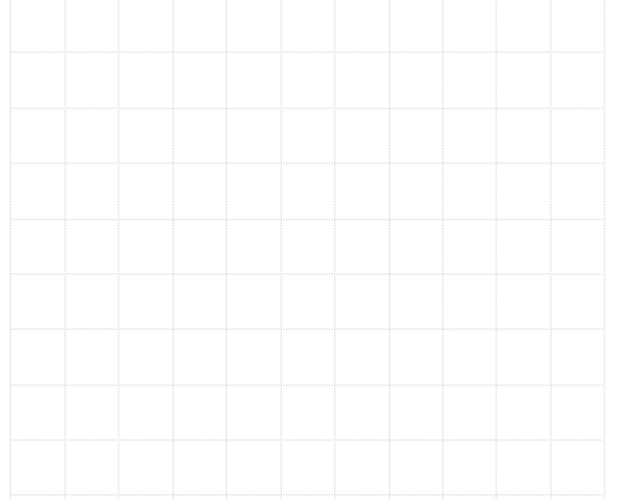
Aşağıda verilen parabolün tepe noktasını bulunuz .

$$f(x) = x^2 + 6x + 5$$

**Örnek**

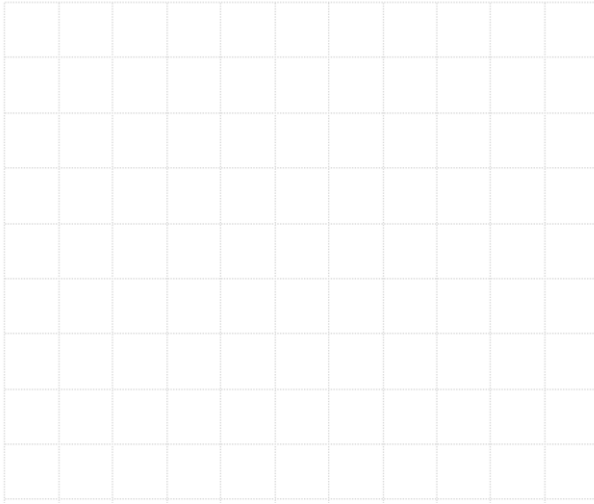
Aşağıda verilen parabolün tepe noktasını bulunuz .

$$f(x) = 3x^2 - 18x + 15$$

**Örnek**

Aşağıda verilen parabolün tepe noktasını bulunuz .

$$f(x) = -x^2 + 4x - 5$$



# Çarpanlara Ayırma

**Örnek :**

Aşağıda verilen ifadeleri çarpanlarına ayırınız

$$x^2 + 5x + 6$$


$$x^2 + 7x + 10$$


$$x^2 + x - 20$$

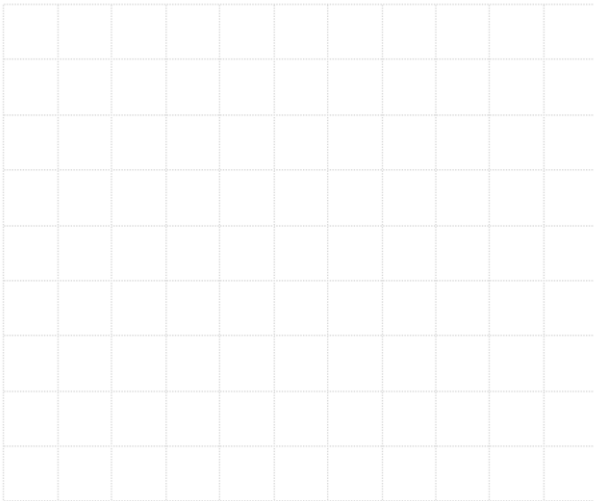

$$x^2 + 6x - 16$$


$$2x^2 + 13x + 15$$

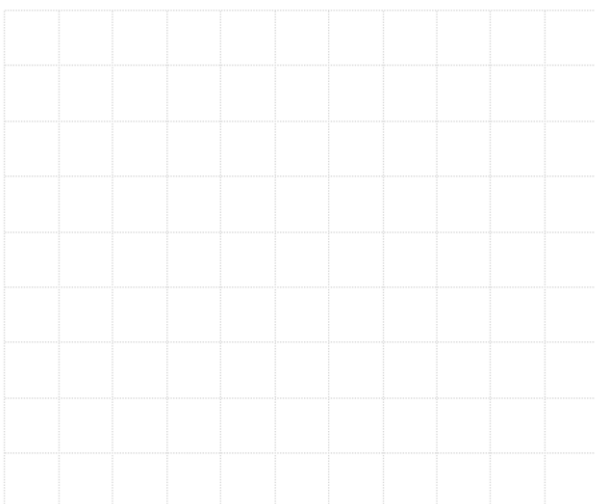

$$6x^2 + 36x + 48$$



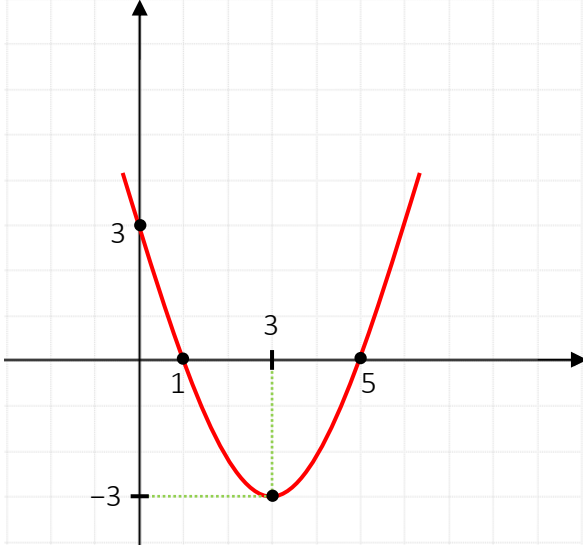
$$3x^2 + 11x + 10$$



$$2x^2 - 5x - 12$$



$$f(x) = ax^2 + bx + c$$

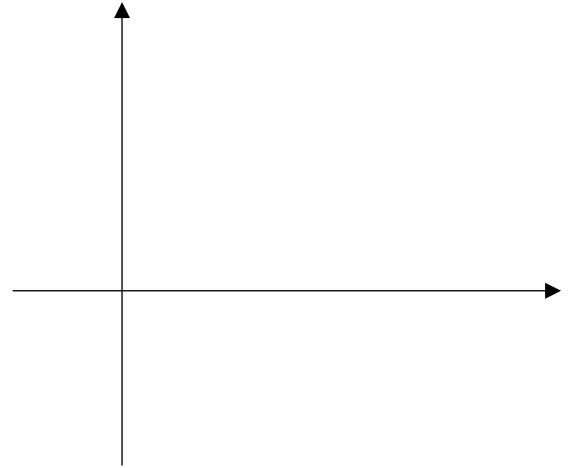
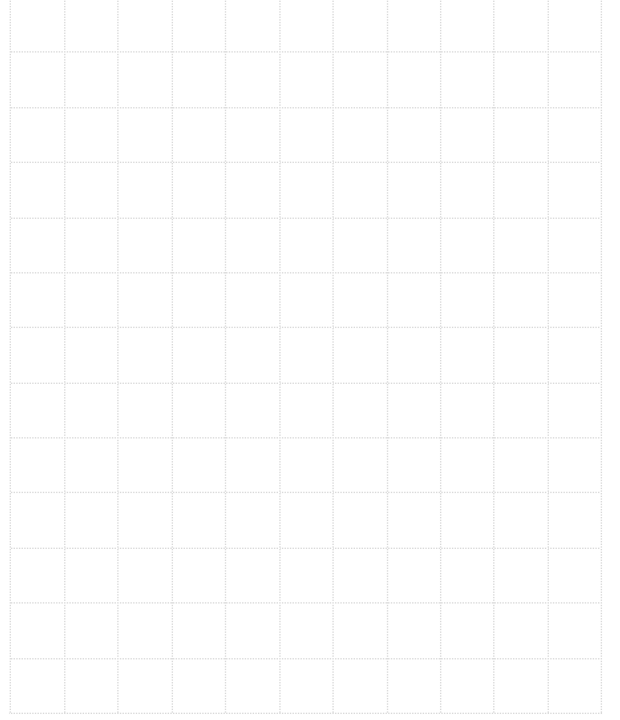


- I. X eksenini kestiği nokta*
- II. Y eksenini kestiği nokta*
- III. Tepe noktası*

**Örnek :**

Aşağıda verilen parabolün grafiğini çizin .

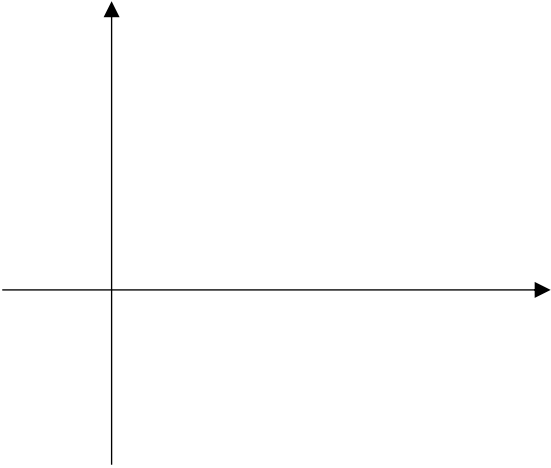
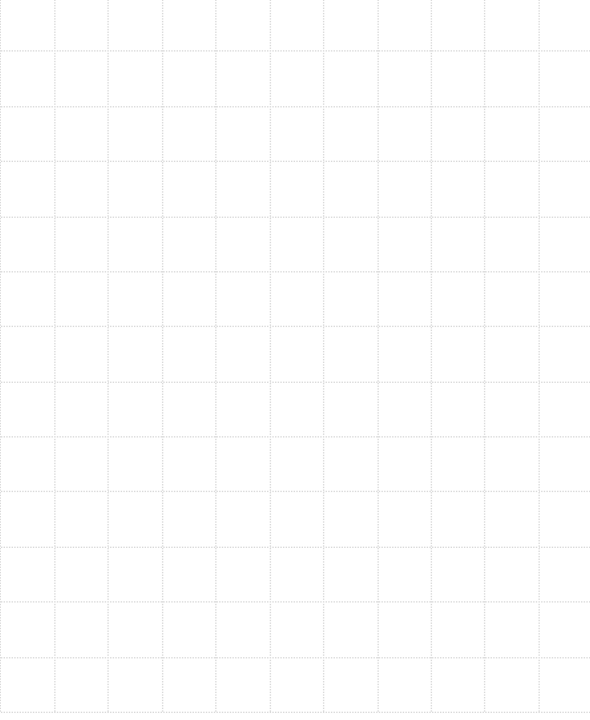
$$f(x) = x^2 - 6x + 5$$



**Soru 1**

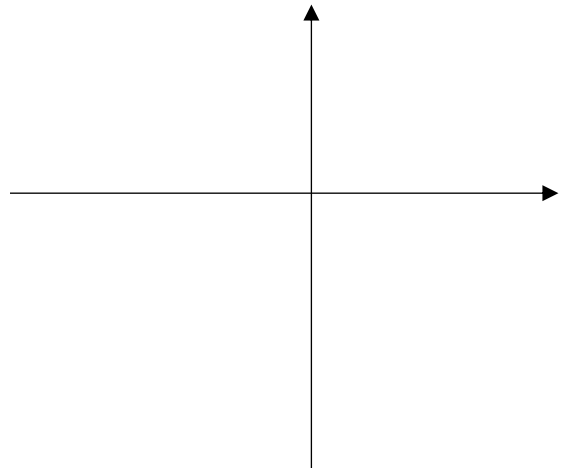
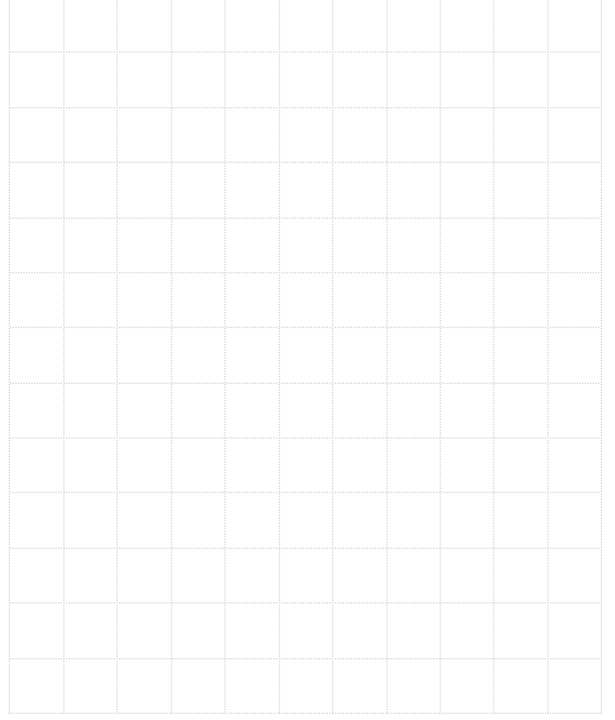
Aşağıda verilen parabolün grafiğini çizin .

$$f(x) = x^2 - 10x + 16$$

**Soru 2**

Aşağıda verilen parabolün grafiğini çizin .

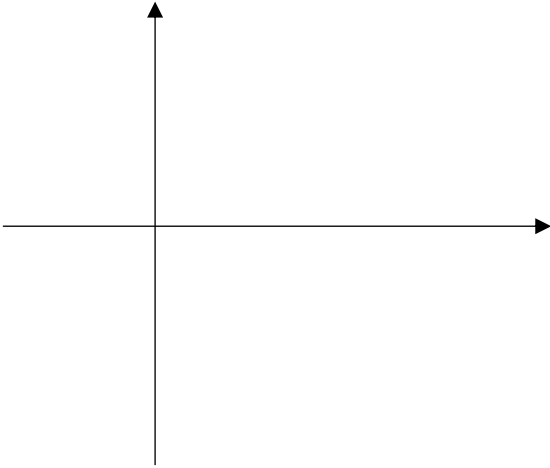
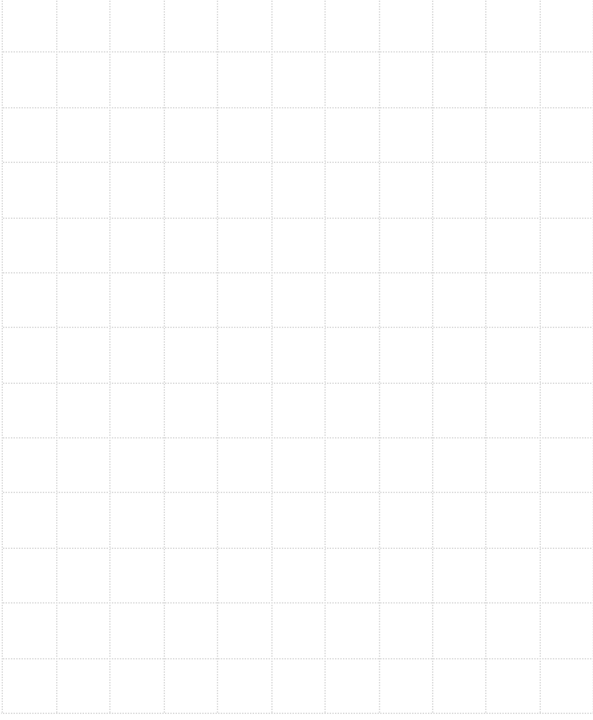
$$f(x) = x^2 + 2x - 8$$



**Soru 3**

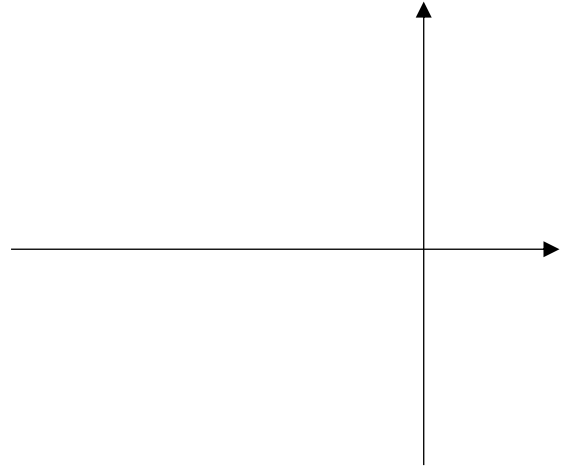
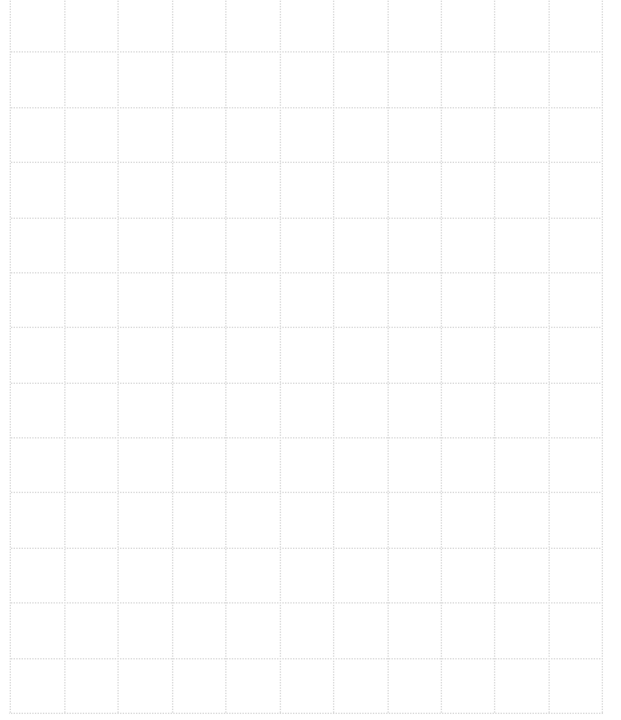
Aşağıda verilen parabolün grafiğini çiziniz .

$$f(x) = -x^2 + 8x - 7$$

**Soru 4**

Aşağıda verilen parabolün grafiğini çiziniz .

$$f(x) = -x^2 - 8x - 12$$

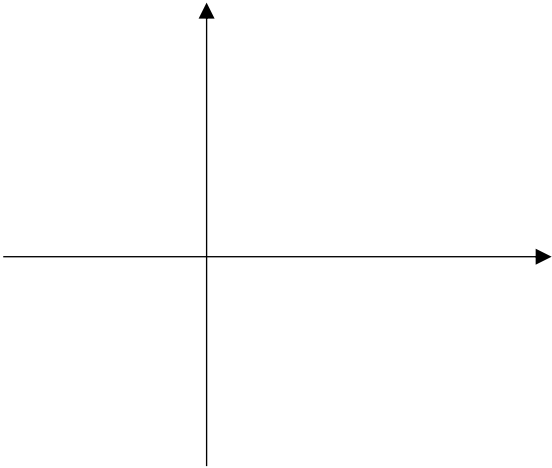
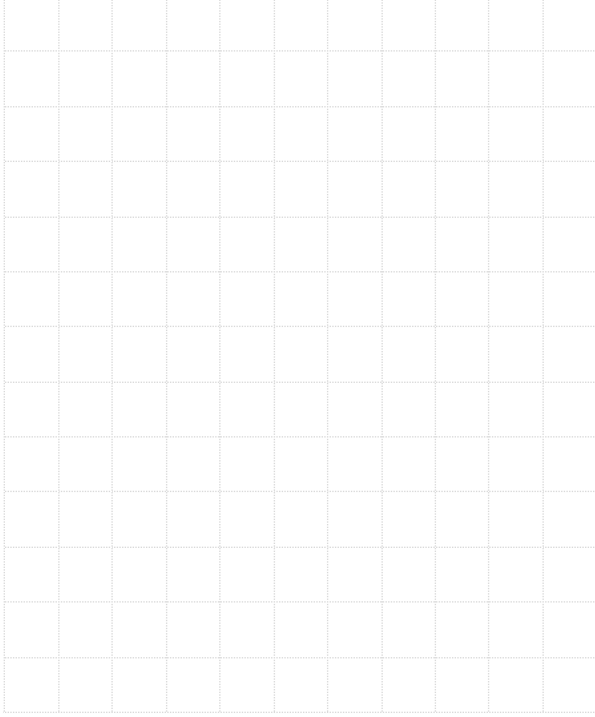




**Soru 5**

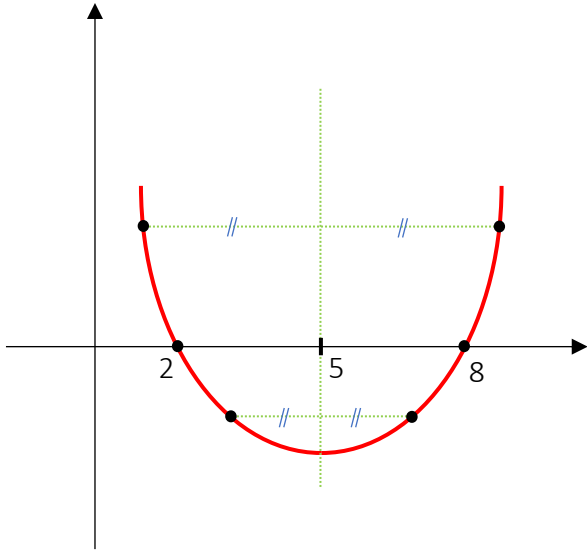
Aşağıda verilen parabolün grafiğini çiziniz .

$$f(x) = -2x^2 + 8x + 24$$



# Simetri Ekseni

$$f(x) = x^2 - 10x + 16$$



## Soru 1

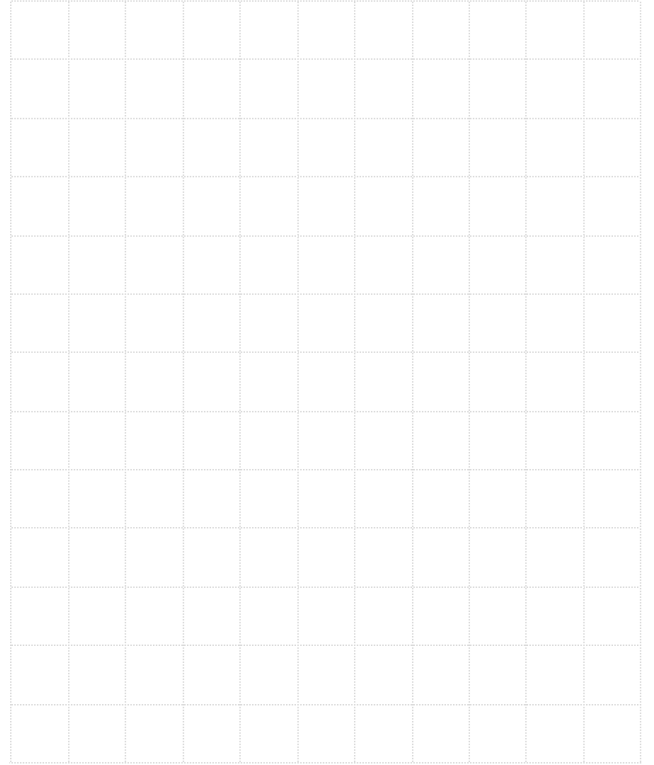
Aşağıda verilen parabollerin simetri eksenlerini bulunuz .

*I* .  $f(x) = 2x^2 + 8x + 15$

*II* .  $g(x) = -3x^2 + 18x - 20$

*III* .  $f(x) = x^2 - 10x + 25$

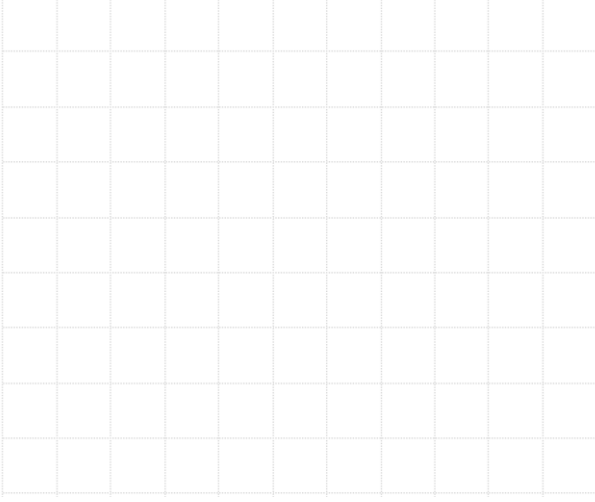
*IV* .  $g(x) = -2x^2 - 12x + 16$



**Soru 2**

$$f(x) = 3x^2 - 2mx + 7$$

Parabolünün simetri eksenini  $x = 4$  doğrusu olduğuna göre,  $m$  kaçtır ?

**Soru 3**

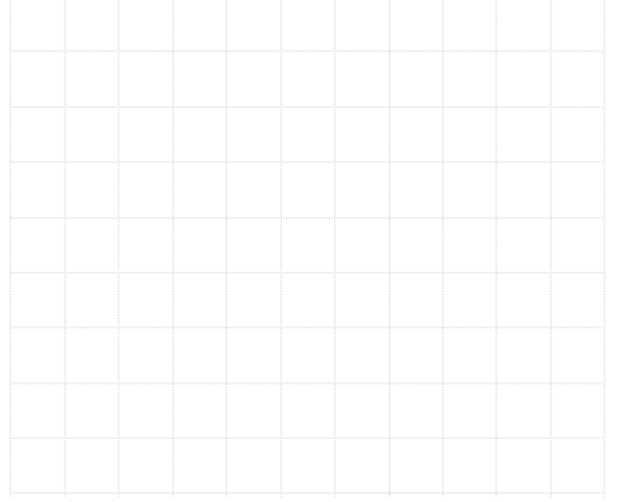
$$f(x) = x^2 + (3m + 2)x + 25$$

Parabolünün simetri eksenini  $x = 5$  doğrusu olduğuna göre,  $m$  kaçtır ?

**Soru 4**

$$f(x) = mx^2 + (4m + 12)x + 8$$

Parabolünün simetri eksenini  $x = -5$  doğrusu olduğuna göre,  $m$  kaçtır ?

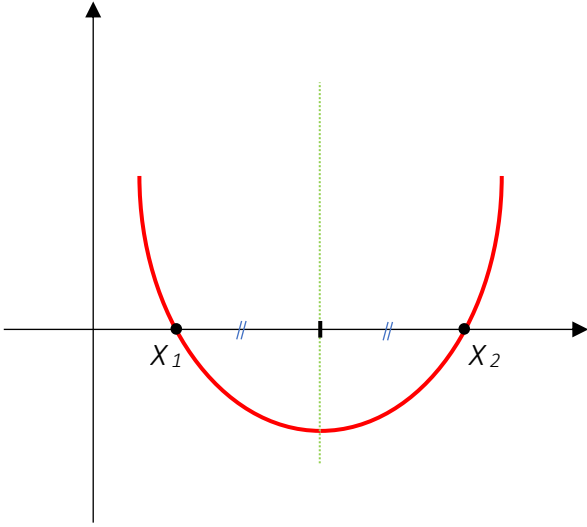
**Soru 5**

$$f(x) = -(m+1)x^2 - 5mx + 10$$

Parabolünün simetri eksenini  $x = -2$  doğrusu olduğuna göre,  $m$  kaçtır ?



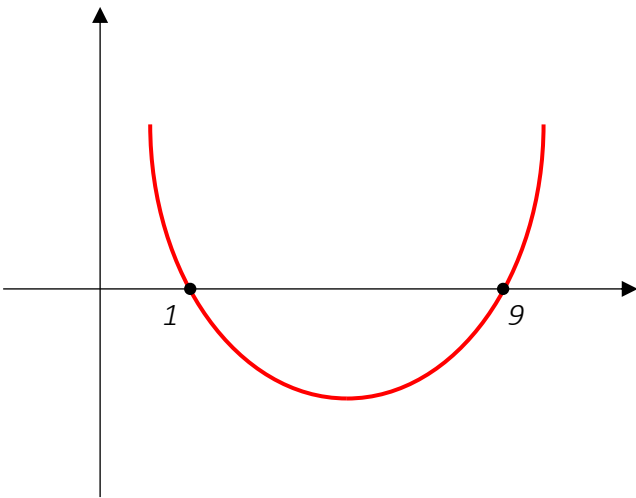
**NOT :**



$$\text{Simetri Eksenini} = \frac{x_1 + x_2}{2}$$

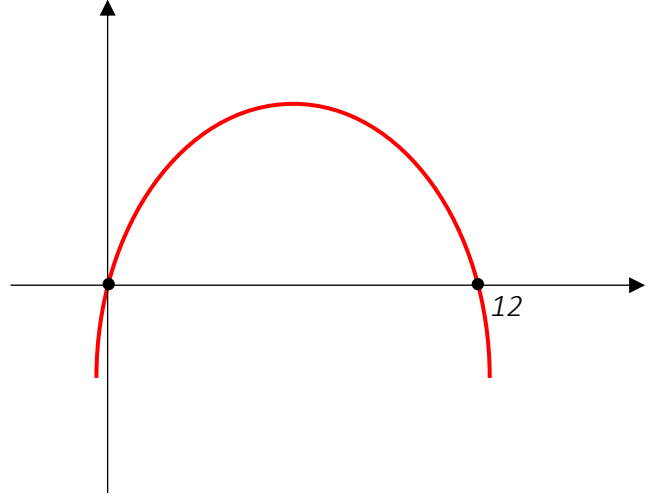
**Soru 6**

Aşağıda grafiği verilen parabolün simetri eksenini bulunuz .



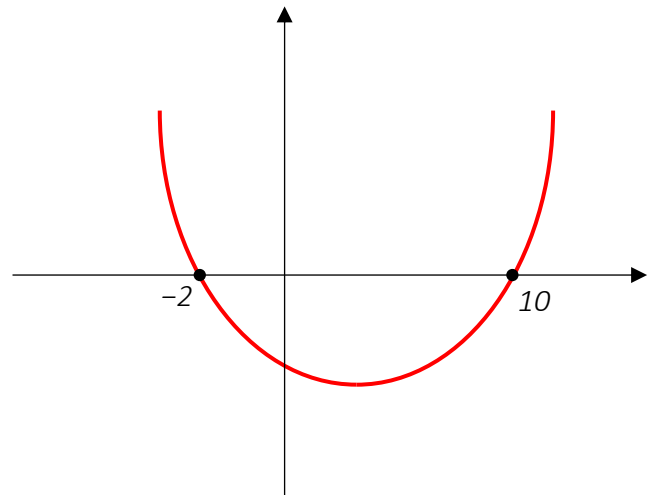
**Soru 7**

Aşağıda grafiği verilen parabolün simetri eksenini bulunuz .



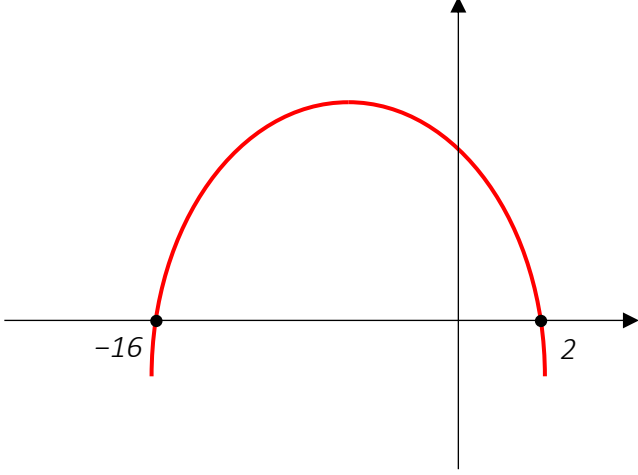
**Soru 8**

Aşağıda grafiği verilen parabolün simetri eksenini bulunuz .

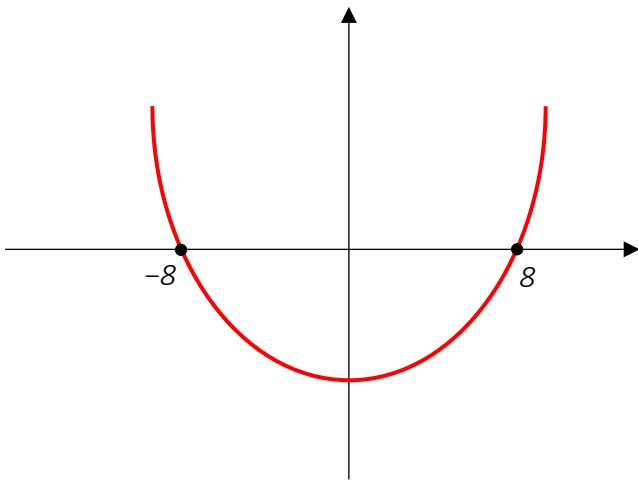


**Soru 9**

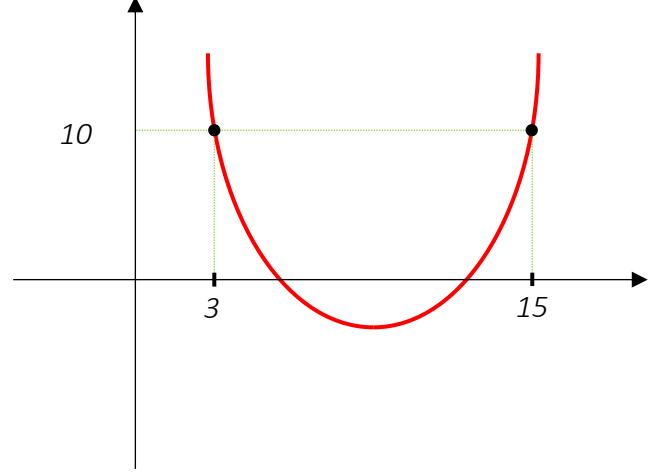
Aşağıda grafiği verilen parabolün simetri eksenini bulunuz .

**Soru 10**

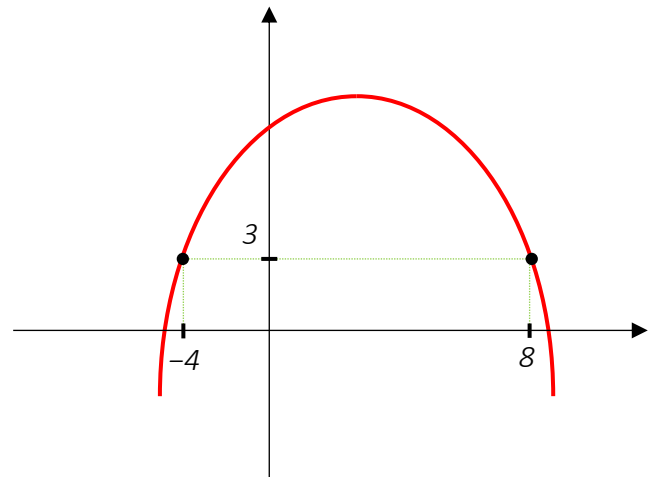
Aşağıda grafiği verilen parabolün simetri eksenini bulunuz .

**Soru 11**

Aşağıda grafiği verilen parabolün simetri eksenini bulunuz .

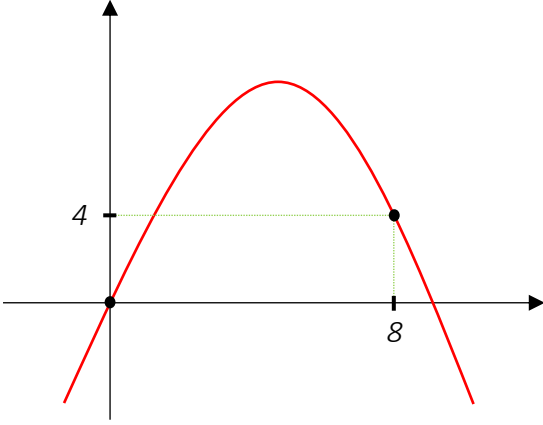
**Soru 12**

Aşağıda grafiği verilen parabolün simetri eksenini bulunuz .

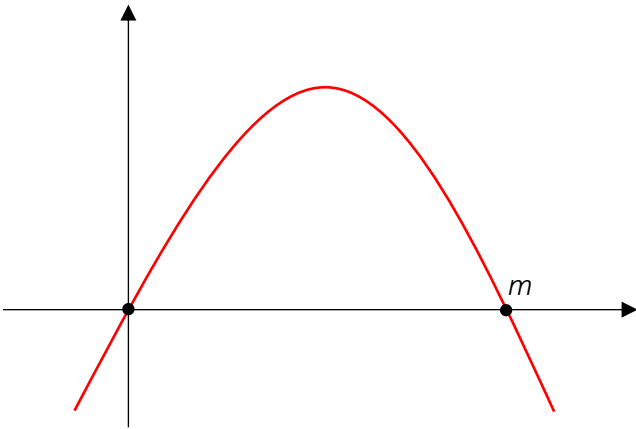


**Soru 13**

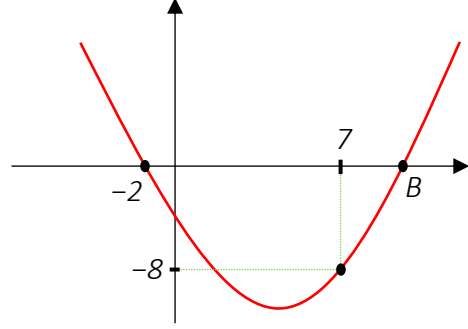
Aşağıda simetri eksenini  $x = 5$  doğrusuna eşit olan  $f(x)$  parabolünün grafiği verilmiştir .  
Buna göre ,  $f(2)$  nin değeri kaçtır ?

**Soru 14**

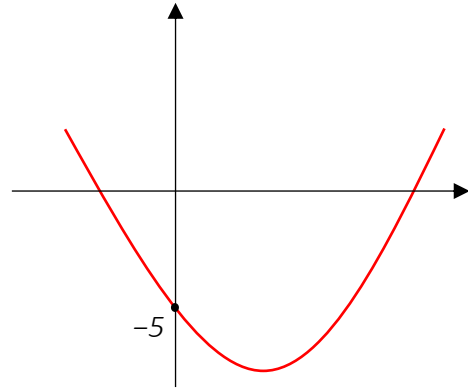
Aşağıdaki şekilde , tepe noktasının apsisi  $r = 8$  olan  $f(x)$  parabolünün grafiği verilmiştir .  
Buna göre  $m$  noktasının değerini bulunuz .

**Soru 15**

Aşağıdaki şekilde , tepe noktasının apsisi  $r = 5$  olan  $f(x)$  parabolünün grafiği verilmiştir .  
 $f(3) = A$  olduğuna göre ,  $A + B = ?$

**Soru 16**

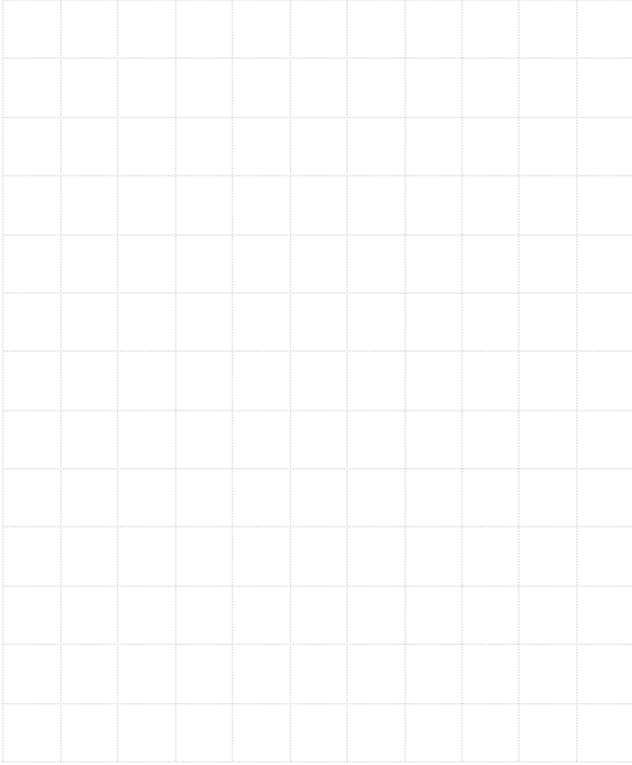
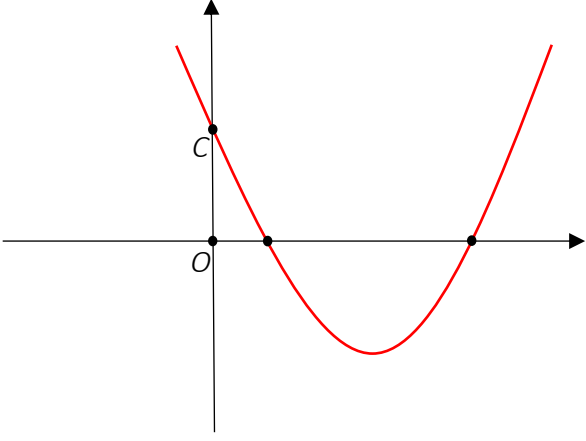
Aşağıda simetri eksenini  $x = 6$  doğrusuna eşit olan  $f(x)$  parabolünün grafiği verilmiştir .  
Buna göre ,  $f(12)$  nin



**Soru 17**

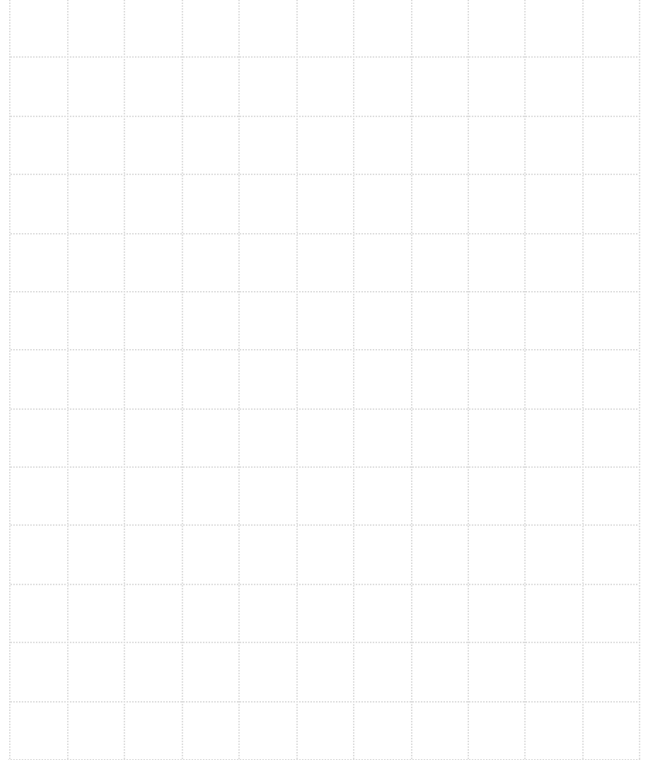
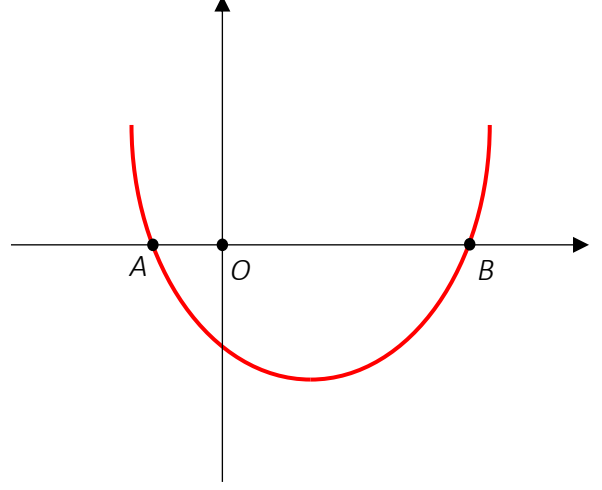
Şekilde  $y = x^2 - 12x + m$  parabolünün grafiği verilmiştir.  $|AB| = 4|AO|$  olduğuna göre

- I . B noktasının apsisi kaçtır ?  
II . C noktasının ordinatı kaçtır ?

**Soru 18**

Şekilde  $f(x) = x^2 - 4x + c$  parabolünün grafiği verilmiştir .

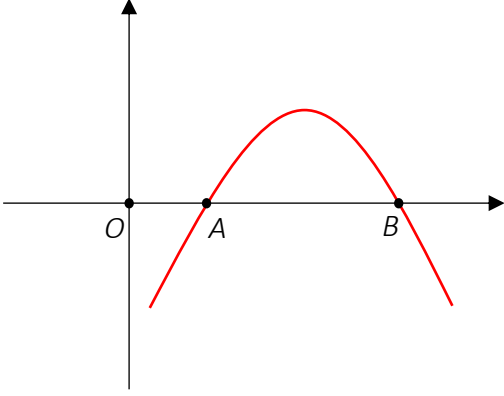
$3|AO| = |OB|$  olduğuna göre , C kaçtır ?



**Soru 19**

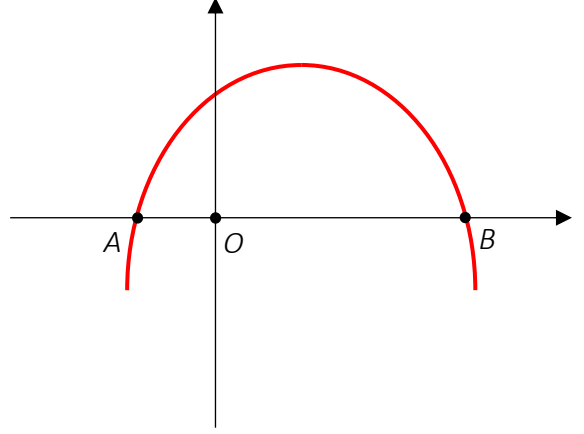
Şekilde  $f(x) = -x^2 + 16x - c$  parabolünün grafiği verilmiştir .

$2|OA| = |AB|$  olduğuna göre , C kaçtır ?

**Soru 20**

Şekilde  $f(x) = -x^2 + 10x + a$  parabolünün grafiği verilmiştir .

$3|OA| = |OB|$  olduğuna göre , C kaçtır ?

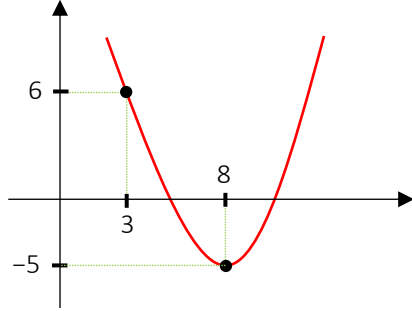




# Parabol Denklemi Kurma

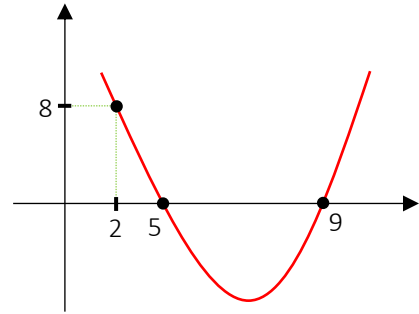
1

Tepe noktası  $\rightarrow T(r, k)$   
Grafik üzerinde nokta  $\rightarrow A(x_0, y_0)$



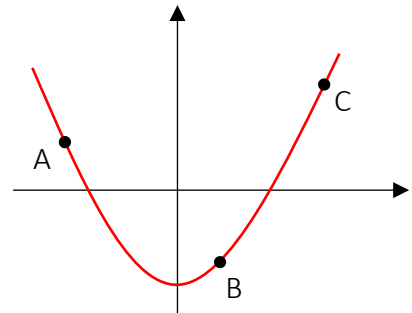
2

X eksenini kesen noktalar  $\rightarrow x_1, x_2$   
Grafik üzerinde nokta  $\rightarrow A(x_0, y_0)$



3

Grafik üzerinde üç nokta :  
 $A(x_1, y_1)$   $B(x_2, y_2)$   $C(x_3, y_3)$



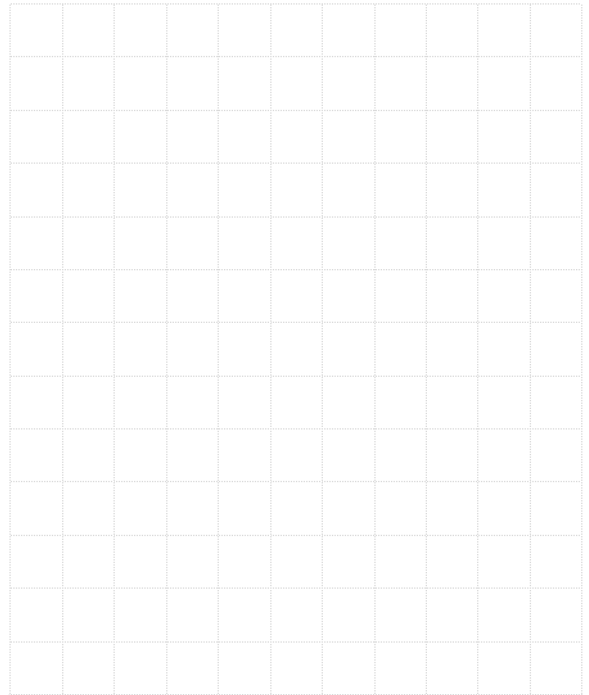
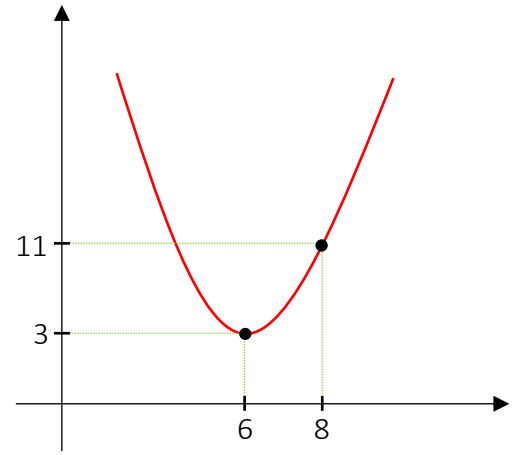
## Örnek

$$f(x) = a \cdot (x - r)^2 + k$$

Tepe noktası  $\rightarrow T(r, k)$

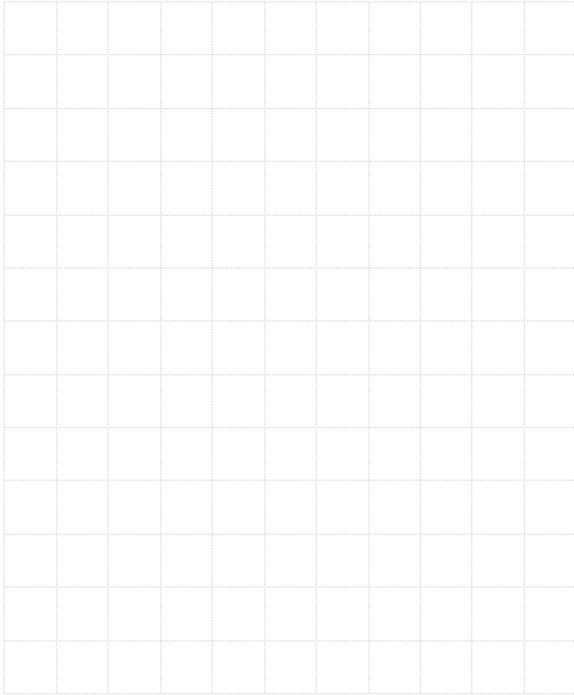
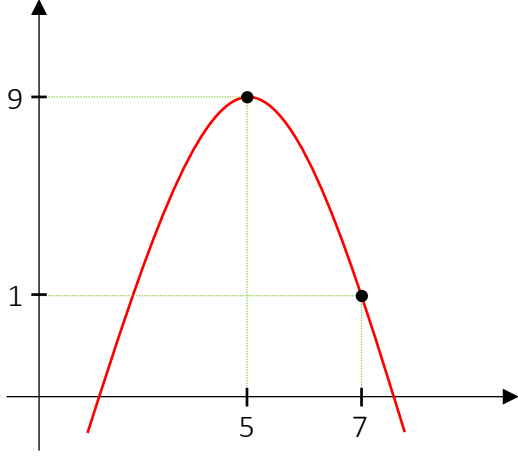
Grafik üzerinde nokta  $\rightarrow A(x_0, y_0)$

Aşağıda grafiği verilen parabolün denklemini kurunuz.

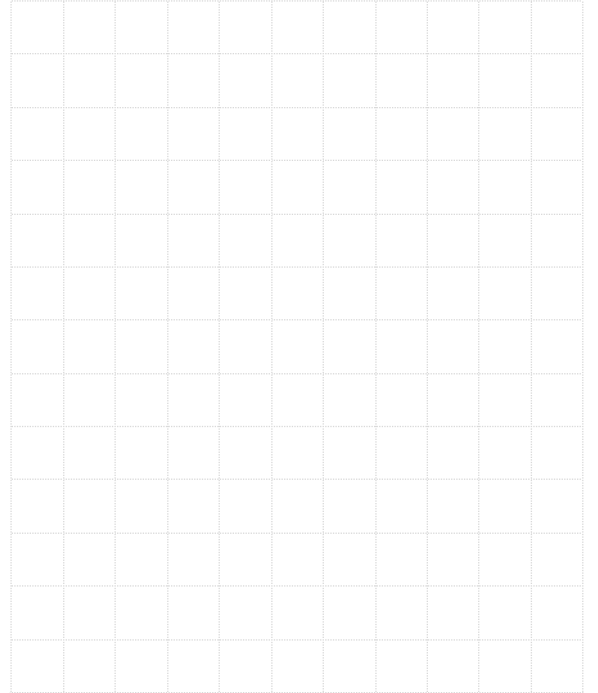
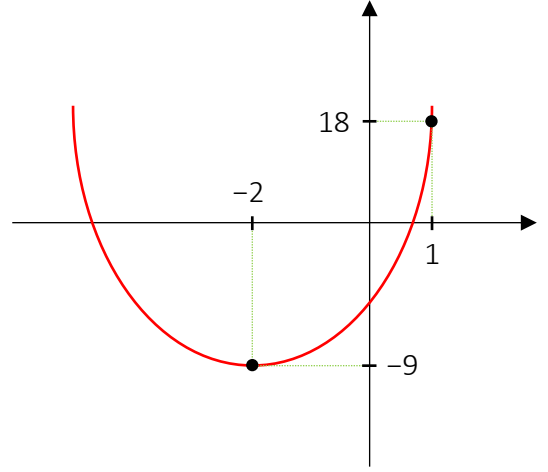


**Soru 1**

Aşağıda şekilde  $f(x)$  parabolünün grafiği verilmiştir .  
 $f(x)$  'in tepe noktası  $T(5, 9)$  olduğuna göre ,  
 $f(x)$  'in denklemini kurunuz .

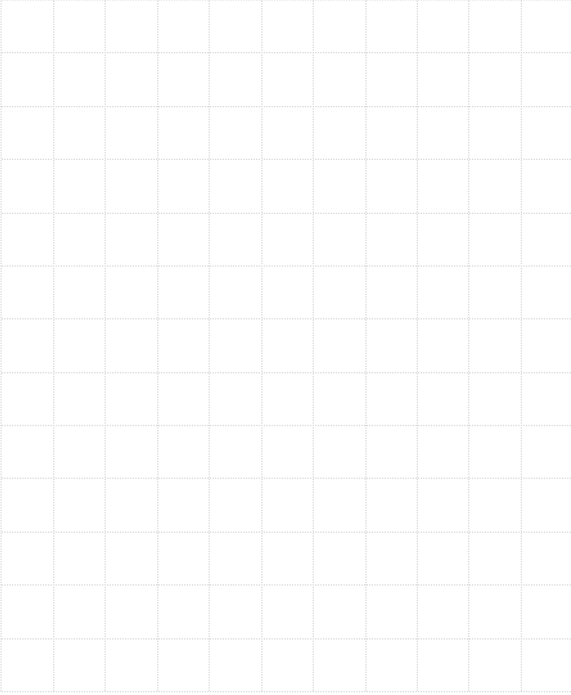
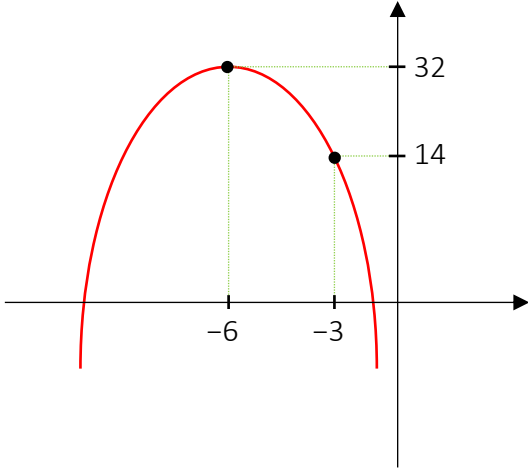
**Soru 2**

Aşağıda şekilde  $f(x)$  parabolünün grafiği verilmiştir .  
 $f(x)$  'in tepe noktası  $T(-2, -9)$  olduğuna göre ,  
 $f(x)$  'in denklemini kurunuz .



### Soru 3

Aşağıda şekilde  $f(x)$  parabolünün grafiği verilmiştir .  
 $f(x)$  'in tepe noktası  $T(-6, 32)$  olduğuna göre ,  
 $f(x)$  'in denklemini kurunuz .



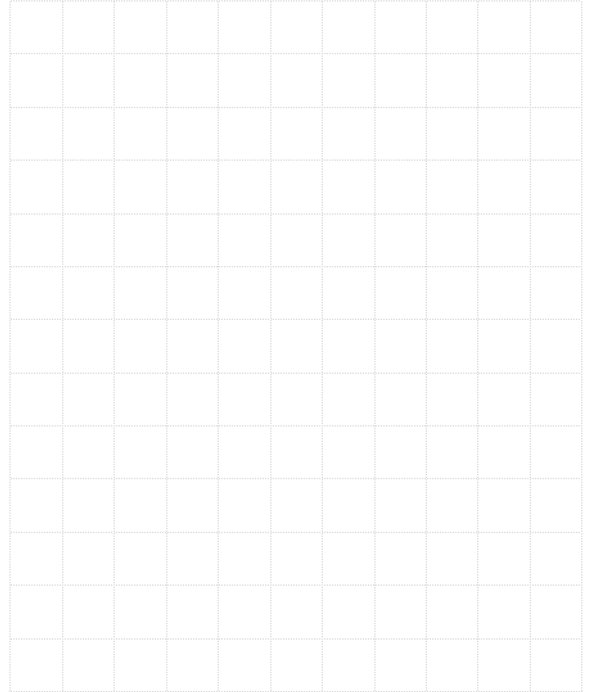
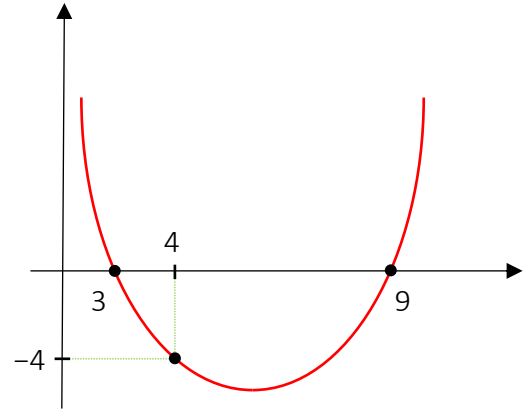
### Örnek

$$f(x) = a.(x - x_1)(x - x_2)$$

$X$  ekseninin keşiği noktalar  $\rightarrow x_1, x_2$

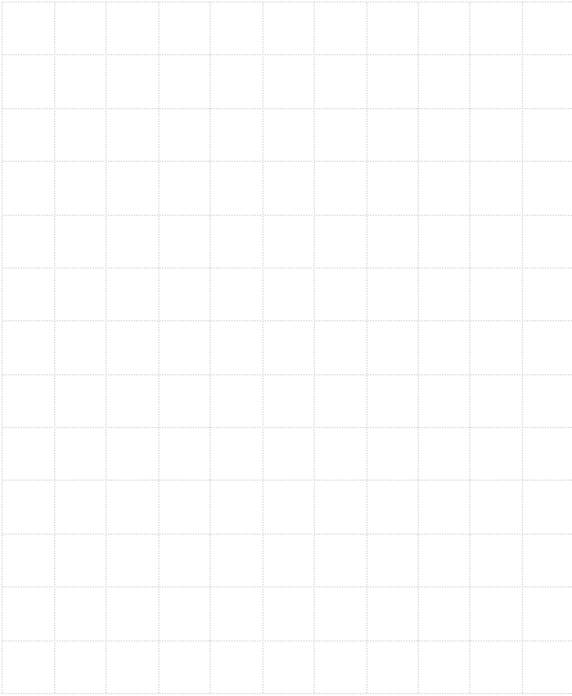
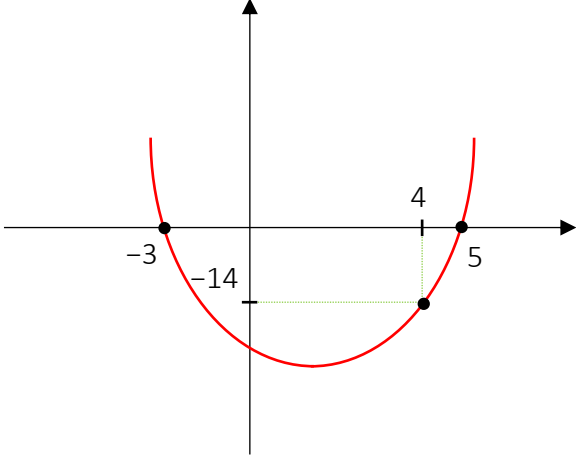
Grafik üzerinde nokta  $\rightarrow A(x_0, y_0)$

Aşağıda grafiği verilen parabolün denklemini kurunuz.

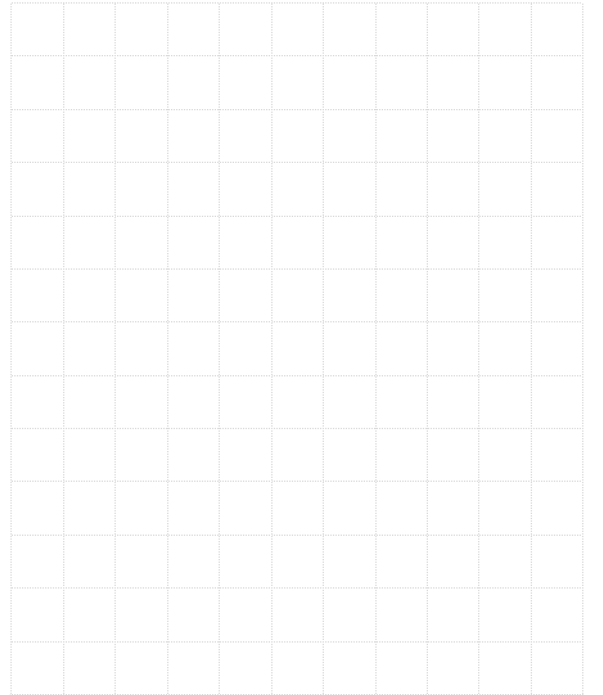
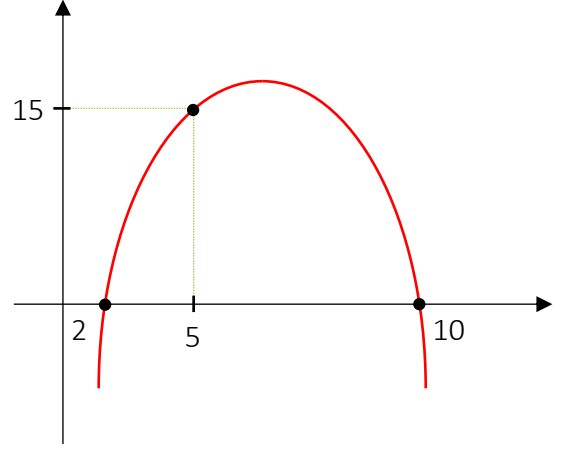


**Soru 1**

Aşağıda şekilde  $f(x)$  parabolünün grafiği verilmiştir .  
 $f(x)$  x eksenini keşiği noktalar  $x_1 = -3$  ve  $x_2 = 5$  olduğuna göre ,  $f(x)$  ' in denklemini kurunuz .

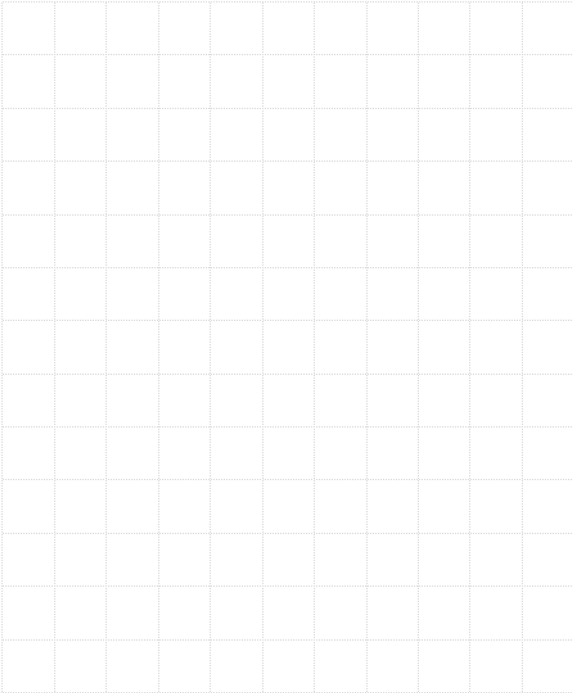
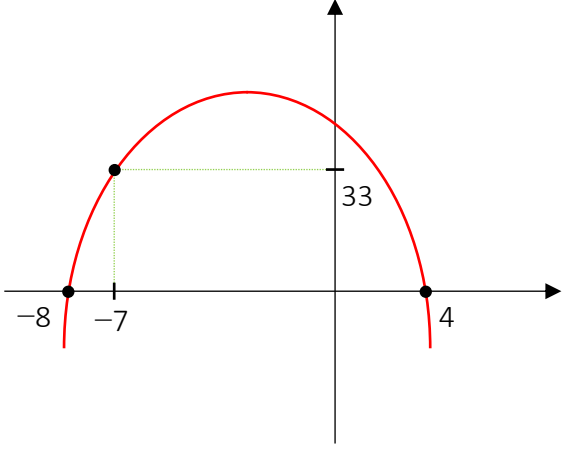
**Soru 2**

Aşağıda şekilde  $f(x)$  parabolünün grafiği verilmiştir .  
 $f(x)$  x eksenini keşiği noktalar  $x_1 = 2$  ve  $x_2 = 10$  olduğuna göre ,  $f(x)$  ' in denklemini kurunuz .

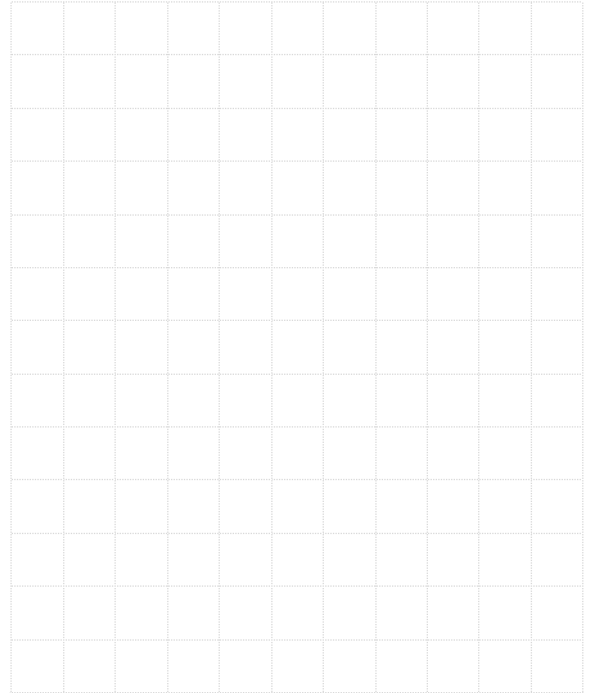
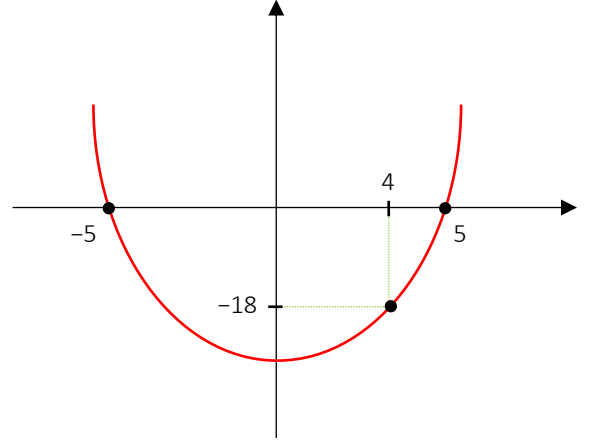


**Soru 3**

Aşağıda şekilde  $f(x)$  parabolünün grafiği verilmiştir .  
 $f(x)$  x eksenini kestiği noktalar  $x_1 = -8$  ve  $x_2 = 4$  olduğuna göre ,  $f(x)$  'in denklemini kurunuz .

**Soru 4**

Aşağıda şekilde  $f(x)$  parabolünün grafiği verilmiştir .  
 $f(x)$  x eksenini kestiği noktalar  $x_1 = -8$  ve  $x_2 = 4$  olduğuna göre ,  $f(x)$  'in denklemini kurunuz .



### Örnek

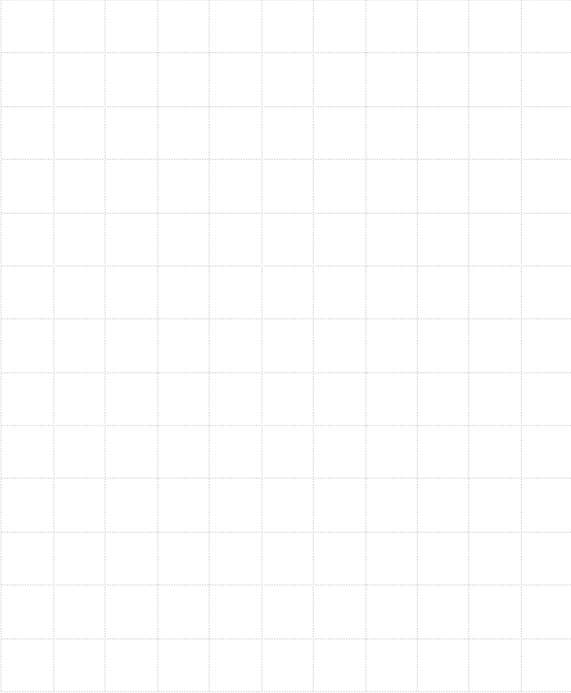
Grafik üzerinde üç nokta :

$A(x_1, y_1)$   $B(x_2, y_2)$   $C(x_3, y_3)$

$$f(x) = ax^2 + bx + c$$

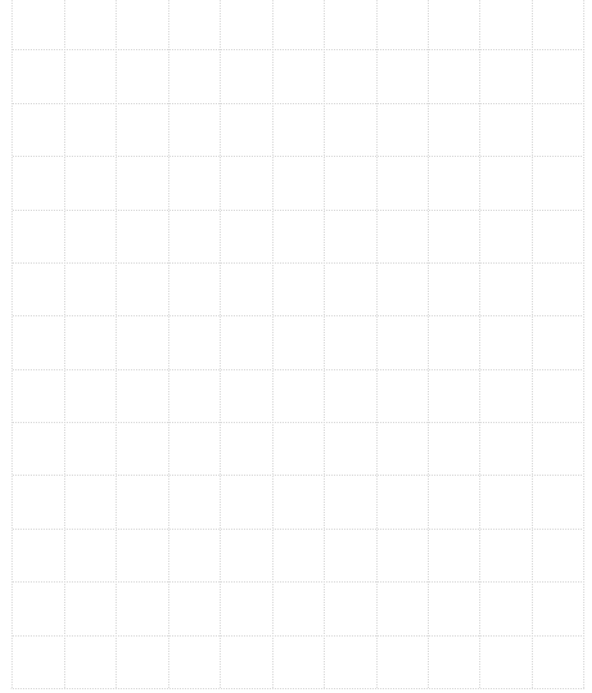
$(0, 15)$  ,  $(1, 24)$  ve  $(-1, 8)$

noktalarından geçen parabolün denklemini kurunuz .



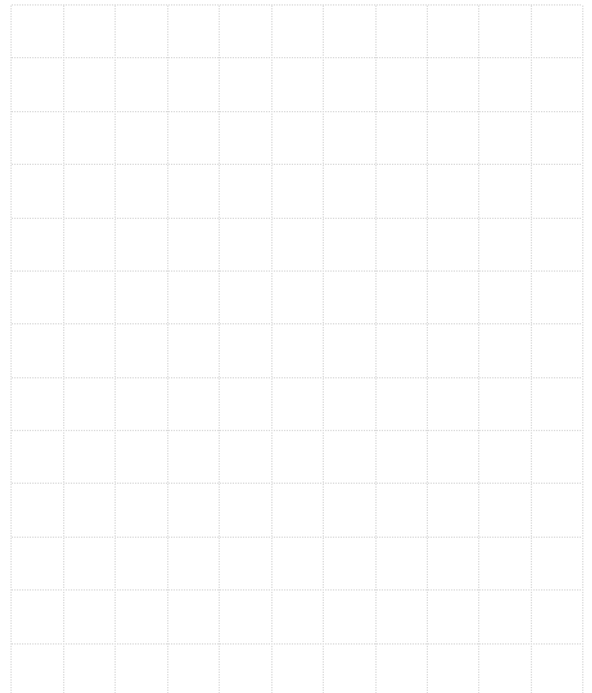
### Soru 1

$(1, 12)$  ,  $(-4, 2)$  ve  $(0, 6)$  noktalarından geçen parabolün denklemini kurunuz .



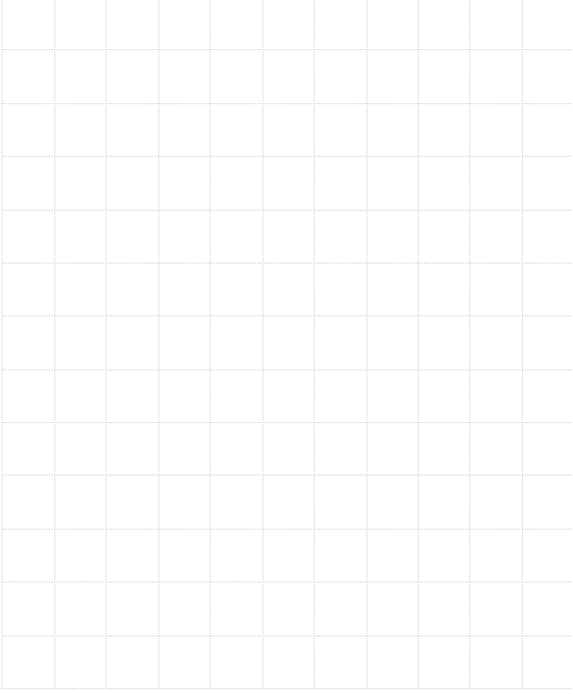
### Soru 2

$(2, 7)$  ,  $(0, -3)$  ve  $(-1, -2)$  noktalarından geçen parabolün denklemini kurunuz .



**Soru 3**

$(2, 21)$  ,  $(-2, 33)$  ve  $(0, -5)$  noktalarından geçen parabolün denklemini kurunuz .

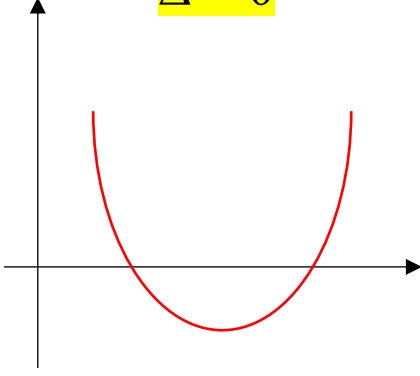


## Parabolün Düzlemde Durumu

### Parabolün X eksenine göre durumu

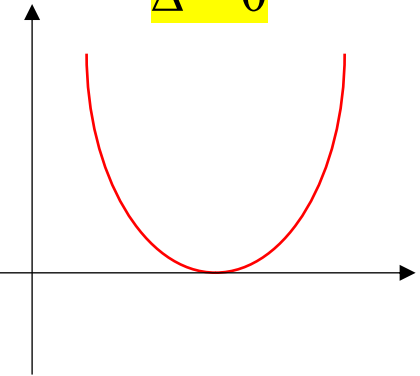
1

$$\Delta > 0$$



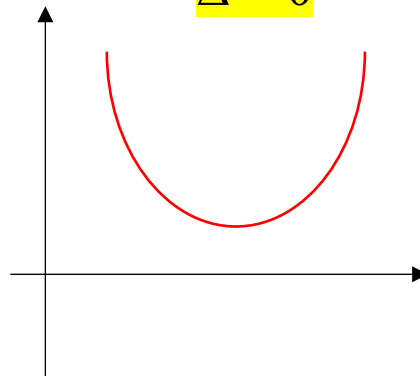
2

$$\Delta = 0$$



3

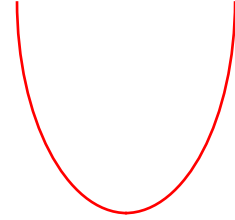
$$\Delta < 0$$



## Parabolün Doğrunun Düzlemdeki Durumu

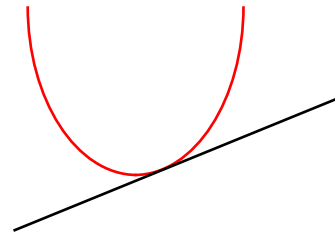
1

$$\Delta > 0$$



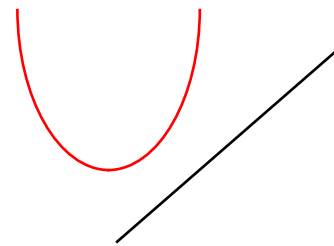
2

$$\Delta = 0$$



3

$$\Delta < 0$$

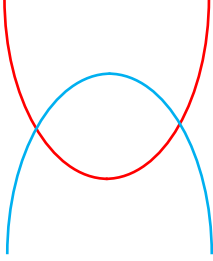




## İki Parabolle Düzlemdeki Durumu

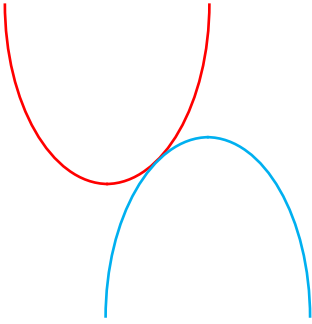
1

$$\Delta > 0$$



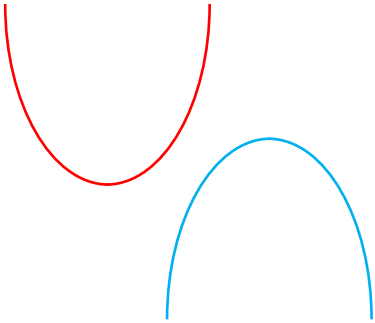
2

$$\Delta = 0$$



3

$$\Delta < 0$$



## Diskriminant Bulma

$$f(x) = ax^2 + bx + c$$

$$\Delta = b^2 - 4ac$$

### Örnek

Aşağıda verilen parabolün diskriminantını bulunuz .

$$f(x) = 2x^2 + 5x + 3$$

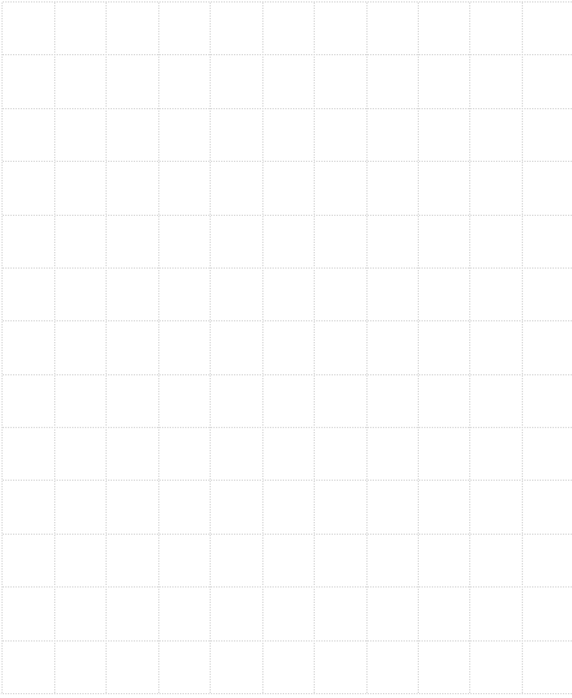
### Örnek

Aşağıda verilen parabolün diskriminantını bulunuz .

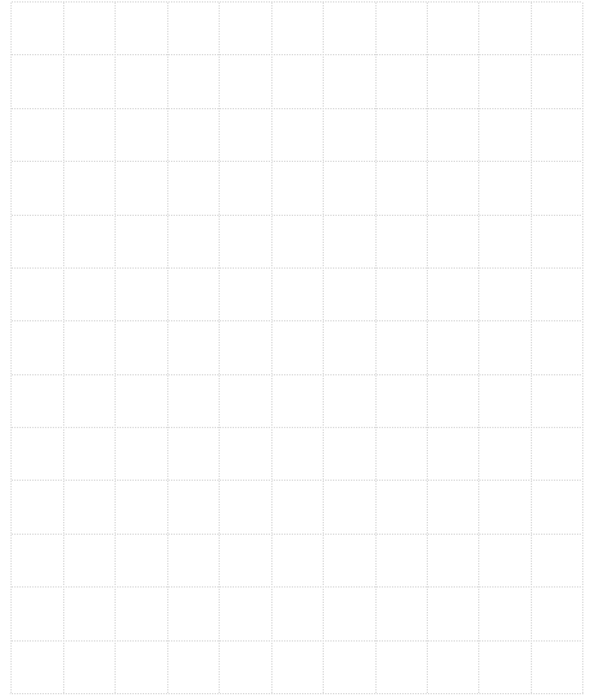
$$f(x) = 3x^2 + 4x + 1$$

$$f(x) = x^2 + 3x - 2$$

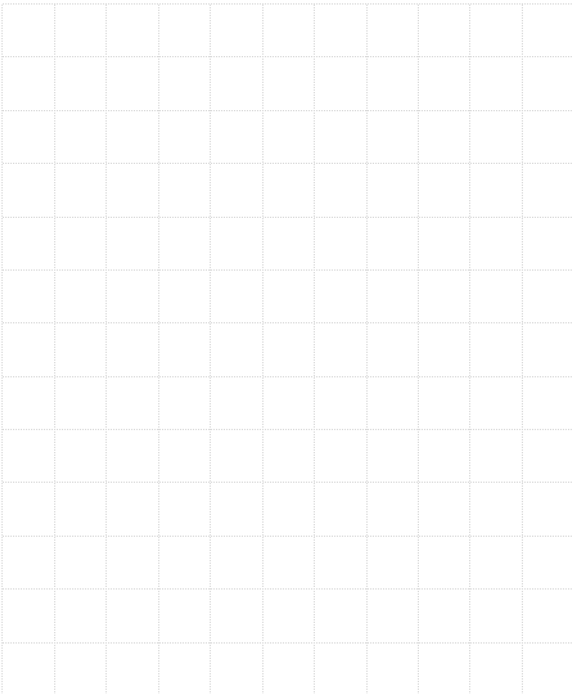
$$f(x) = -x^2 - 2x + 3$$



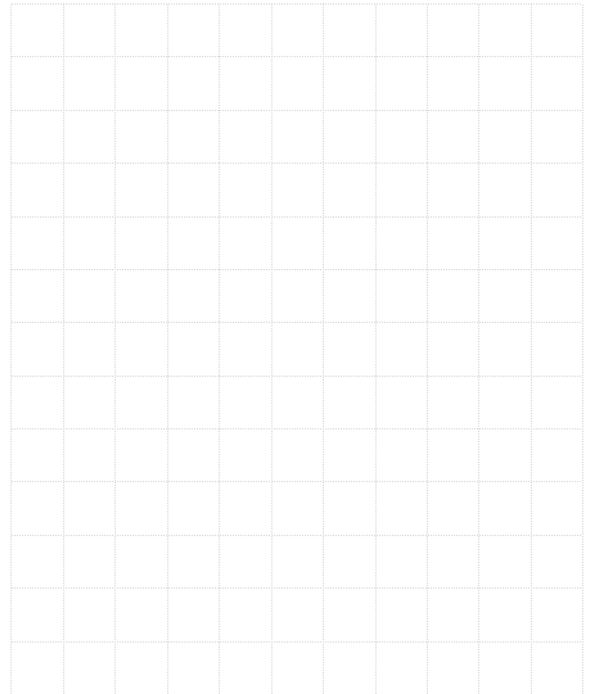
$$f(x) = 3x^2 + 2$$



$$f(x) = 5x^2 + 5x + 2$$



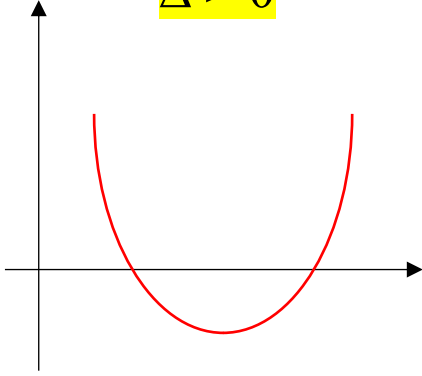
$$f(x) = 4x^2 + 5x$$



## Parabolün X eksenini ile durumu

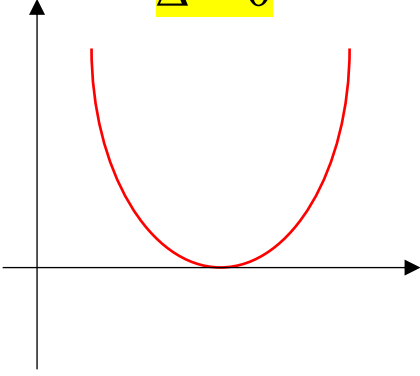
1

$$\Delta > 0$$



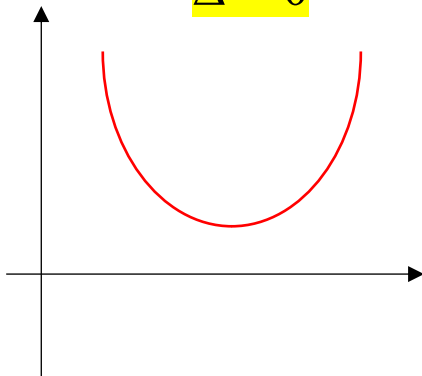
2

$$\Delta = 0$$



3

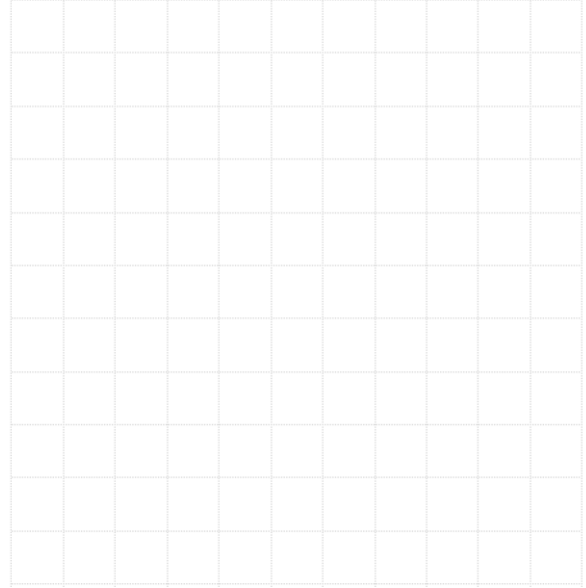
$$\Delta < 0$$



### Soru 1

Aşağıda verilen  $f(x)$  Parabolünün x eknini kaç farklı noktada kestiğini bulunuz .

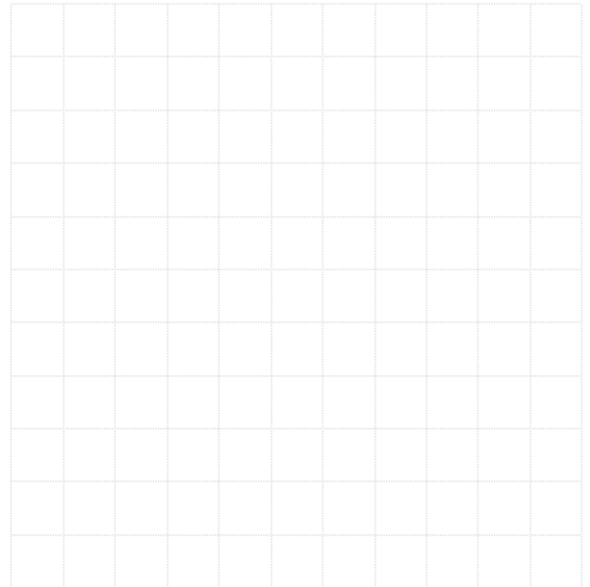
$$f(x) = x^2 + 5x + 6$$



### Soru 2

Aşağıda verilen  $f(x)$  Parabolünün x eknini kaç farklı noktada kestiğini bulunuz .

$$f(x) = -2x^2 + 3x + 1$$

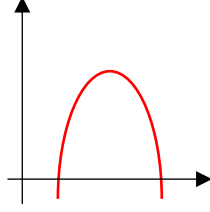
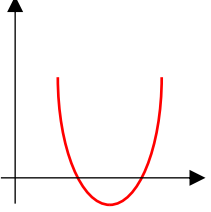


**NOT :**

$$f(x) = ax^2 + bx + c$$

$$a > 0$$

$$a < 0$$

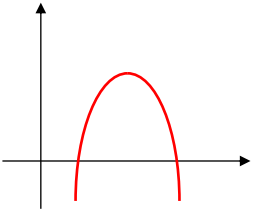


**Soru 3**

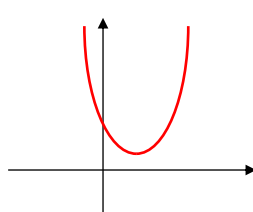
$$f(x) = x^2 - 4x + 3$$

$f(x)$  Parabolünün grafiği aşağıdakilerden hangisi olabilir .

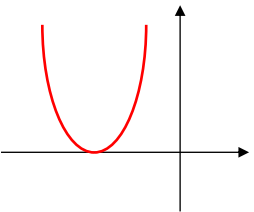
A)



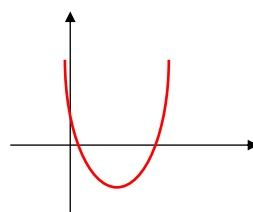
B)



C)



D)

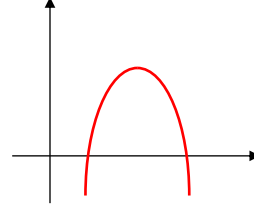


**Soru 4**

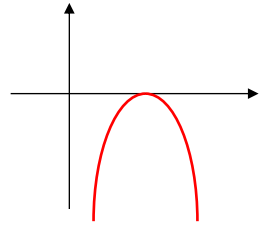
$$f(x) = -2x^2 + 4x - 2$$

$f(x)$  Parabolünün grafiği aşağıdakilerden hangisi olabilir .

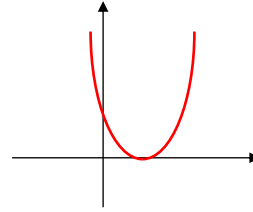
A)



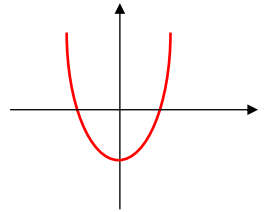
B)



C)



D)

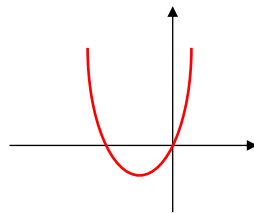


**Soru 5**

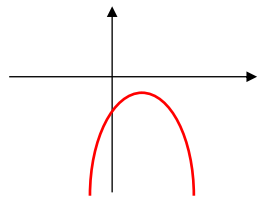
$$f(x) = x^2 + 3x + 5$$

$f(x)$  Parabolünün grafiği aşağıdakilerden hangisi olabilir .

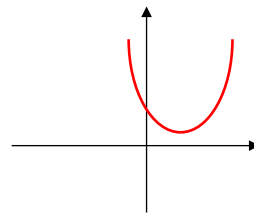
A)



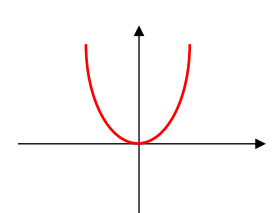
B)



C)



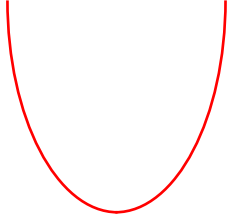
D)



## Parabolle Doğrunun Düzlemdeki Durumu

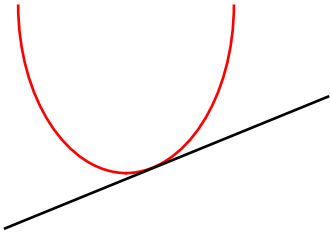
1

$$\Delta > 0$$



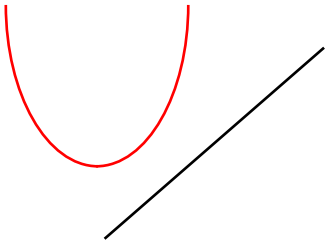
2

$$\Delta = 0$$



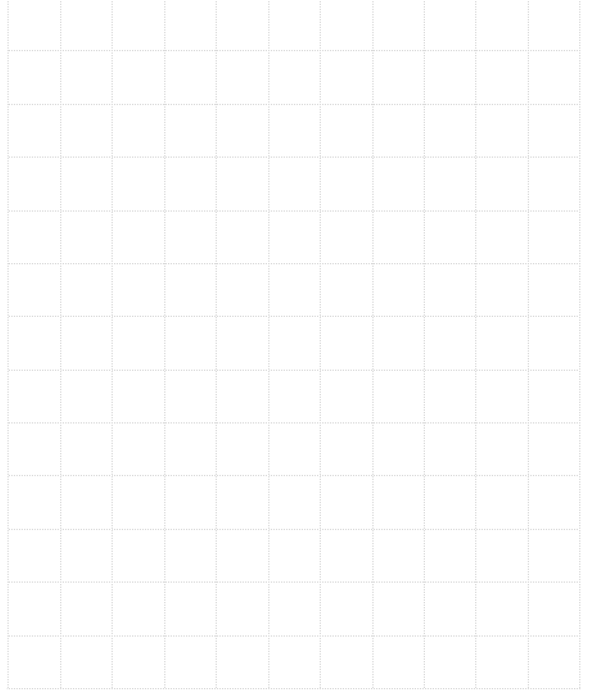
3

$$\Delta < 0$$



### Örnek

$y = x^2 + 2x - 15$  parabolü ile  $y = x + 5$  doğrusunun kaç farklı noktadakesiştiğini bulunuz .



**Soru 1**

$y = x^2 + 7x + 6$  parabolü ile  $y = x - 3$  doğrusunun kaç farklı noktada kesiştiğini bulunuz .

**Soru 2**

$y = 3x^2 + 8x - 4$  parabolü ile  $y = 3x - 6$  doğrusunun kaç farklı noktada kesiştiğini bulunuz .

**Soru 3**

$y = x^2 + 4x + 5$  parabolü ile  $y = 2x + 1$  doğrusunun kaç farklı noktada kesiştiğini bulunuz .

**Soru 4**

$y = 2x^2 + 5x + 3$  parabolü ile  $y = -3x - 5$  doğrusunun kaç farklı noktada kesiştiğini bulunuz .

**Soru 5**

$y = x - a$  doğrusu  $y = x^2 - x - 2$  parabolüne teğet olduğuna göre,  $a$  kaçtır ?

**Soru 6**

$y = 3x + 6$  doğrusu ile  $y = 9x^2 + 15x + m$  parabolü tek bir noktada kesiştiklerine göre,  $m$  kaçtır ?

**Soru 7**

$y = 2x - 1$  doğrusu ile  $y = -x^2 + 4x - m$  parabolü iki farklı noktada kesiştiklerine göre,  $m$  nin en geniş tanım aralığı aşağıdakilerden hangisidir ?

- A)  $m < 7$                       B)  $m > 10$   
C)  $m < 2$                       D)  $1 < m$



**Soru 8**

$y = x^2 + 3x + m$  parabolü ile  $y = x + 2$  doğrusu iki farklı noktada kesiştiklerine göre ,  $m$  nin en geniş tanım aralığı aşağıdakilerden hangisidir ?

- A)  $m < 0$                       B)  $m > 8$   
C)  $m < 3$                       D)  $5 < m$

**Soru 9**

$y = 2x^2 - 3x + m$  parabolü ile  $y = x - 1$  doğrusu kesişmediklerine göre ,  $m$  nin en geniş tanım aralığı aşağıdakilerden hangisidir ?

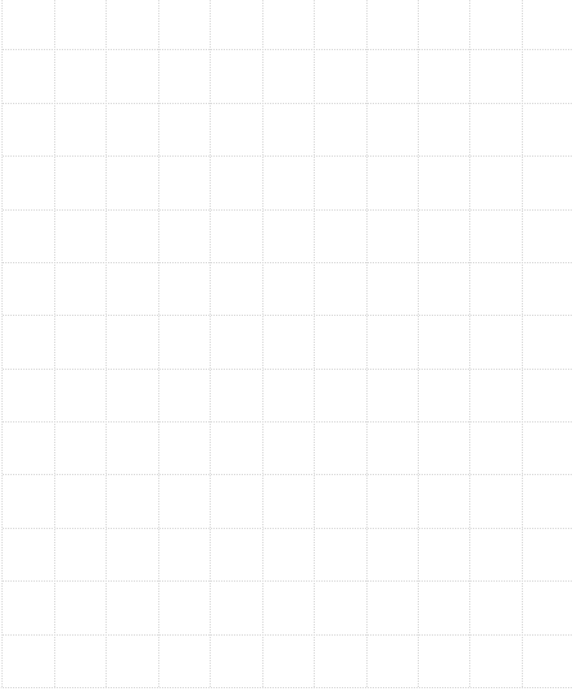
- A)  $m < 4$                       B)  $m > -1$   
C)  $m > 1$                       D)  $6 < m$

**Parabolle Doğrunun Kesiştiği Noktaları Bulmak****Soru 1**

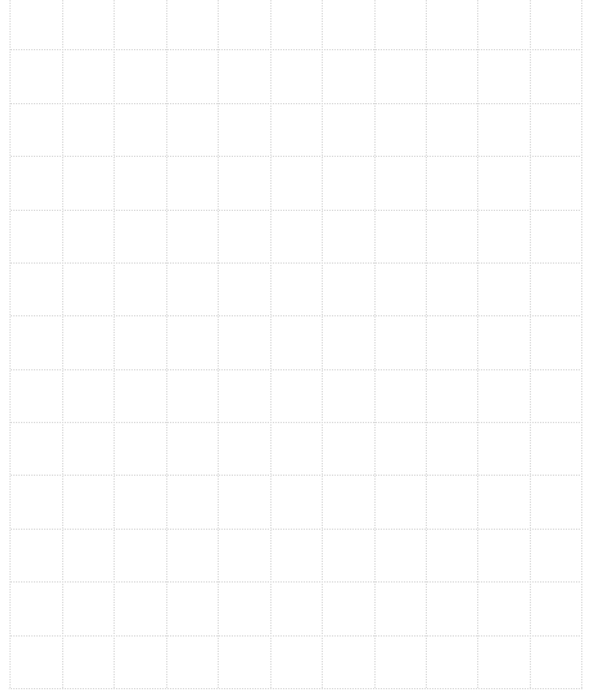
$y = 2x^2 + x - 20$  parabolü ile  $y = 5x + 10$  doğrusu iki farklı noktada kesiştiklerine göre , bu iki noktanın koordinatlarını bulunuz .

**Soru 2**

$y = x^2 + 8x - 4$  parabolü ile  $y = 3x + 2$  doğrusu iki farklı noktada kesiştiklerine göre , bu iki noktanın koordinatlarını bulunuz .

**Soru 3**

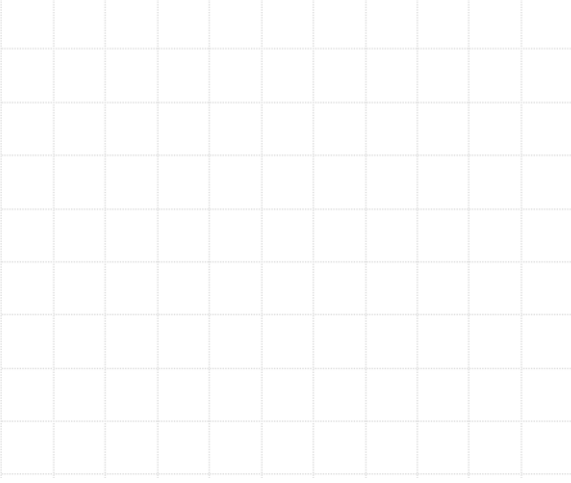
$y = 2x^2 + 3x + 9$  parabolü ile  $y = -5x + 1$  doğrusu tek bir noktada kesiştiklerine göre , bu noktanın koordinatlarını bulunuz .



**NOT :**

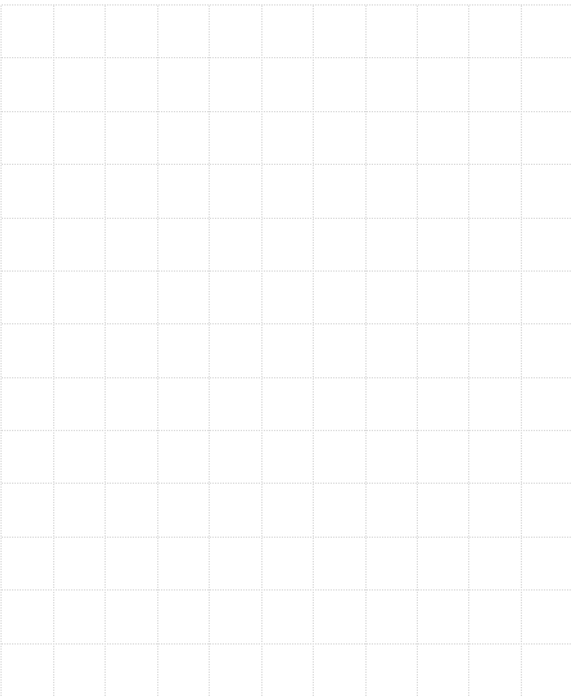
**Düzlemde İki Nokta Arasındaki  
Uzaklığı Bulma :**

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



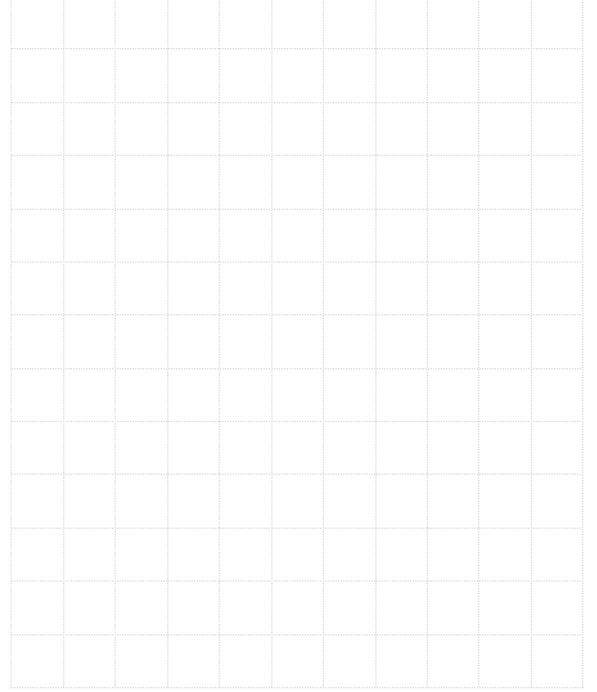
**Soru 4**

$y = x^2 - 6x + 8$  parabolü ile  $y = 2x + 1$  doğrusunun kesiştiği noktalar arasındaki uzaklığı bulunuz .



**Soru 5**

$y = x^2 + 3x - 10$  parabolü ile  $y = x + 5$  doğrusunun kesiştiği noktalar arasındaki uzaklığı bulunuz .





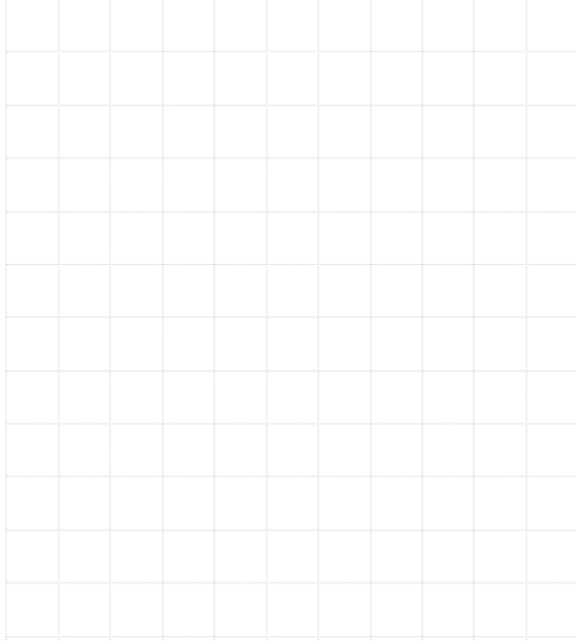
**Soru 3**

$y = x^2 - mx + 24$  parabolü ile  $y = 2x + 4$

doğrusunun kesim noktaları A ve B dir .

[AB] nin orta noktasının apsisi 6 olduğuna göre ,

m kaçtır ?

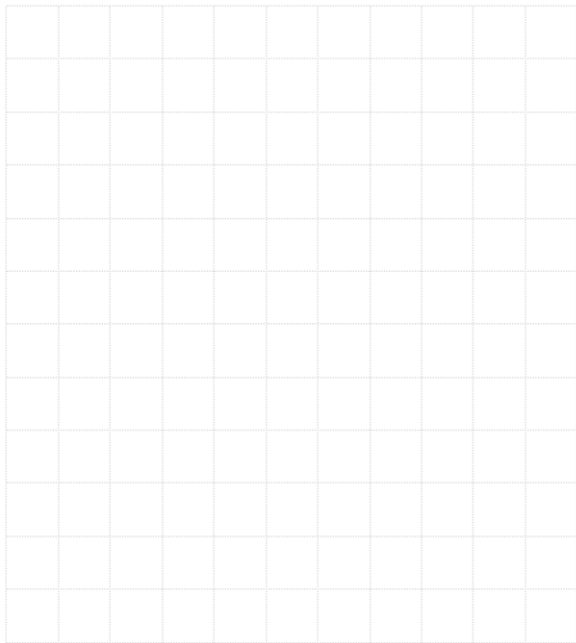
**Soru 4**

$y = x^2 - mx - 24$  parabolü ile  $y = -x + 2$

doğrusunun kesim noktaları A ve B dir .

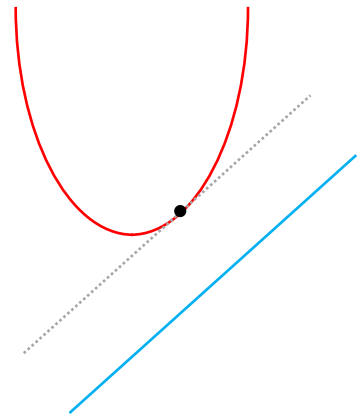
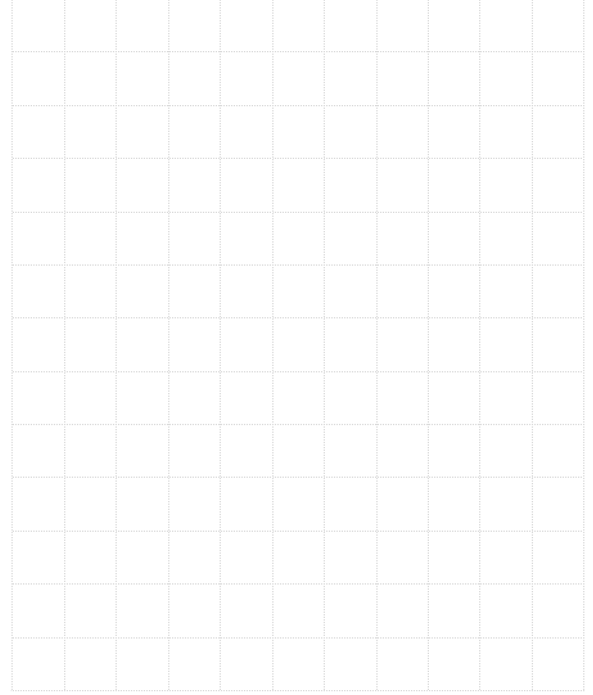
[AB] nin orta noktasının apsisi 4 olduğuna göre ,

m kaçtır ?

**Parabolün Doğruya en Yakın Noktasını Bulma****Soru 1**

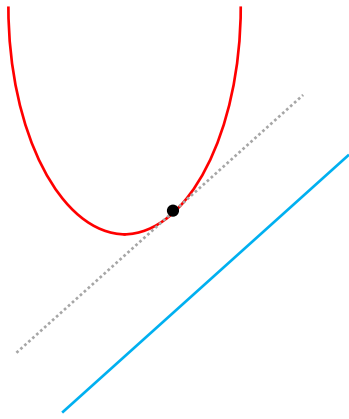
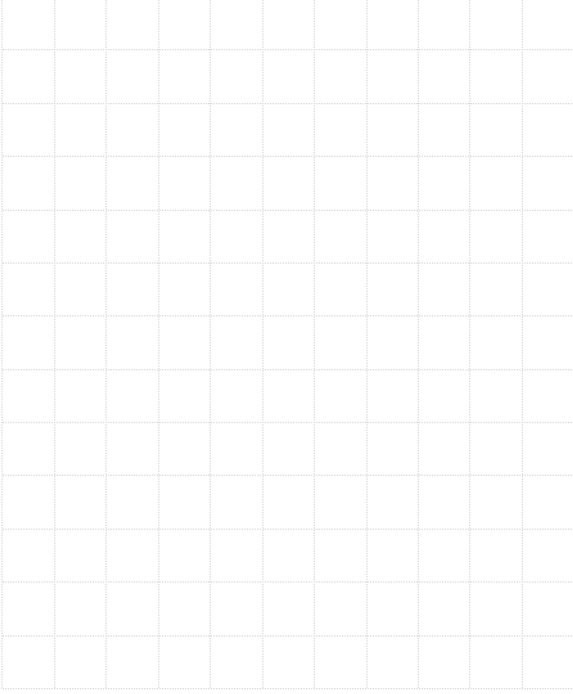
$y = x^2 - x + 2$  parabolünün  $y = x + 1$  doğrusuna

en yakın noktasının koordinatlarını bulunuz .

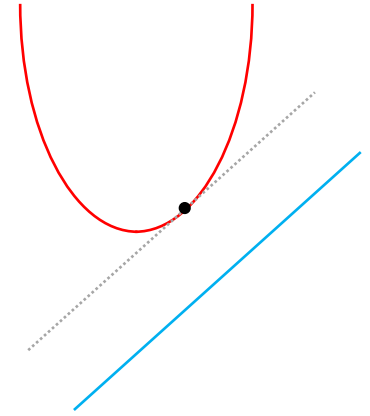
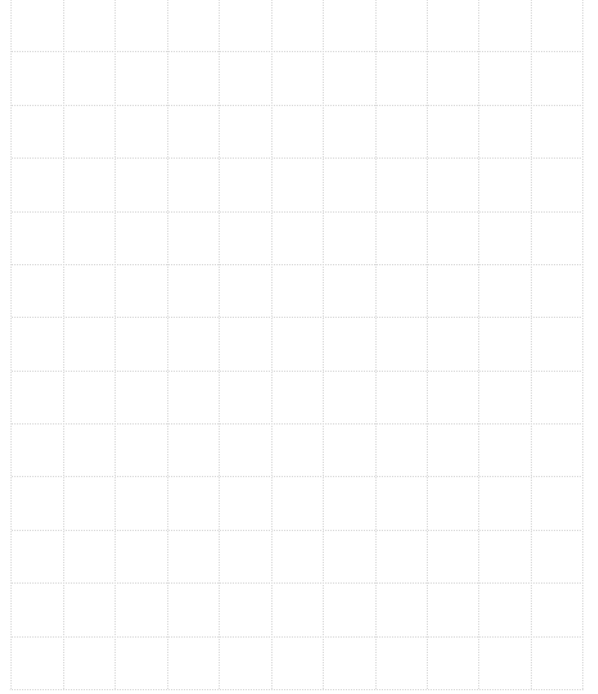


**Soru 2**

$y = x^2 - 2x + 3$  parabolünün  $y = 4x - 1$  doğrusuna en yakın noktasının koordinatlarını bulunuz .

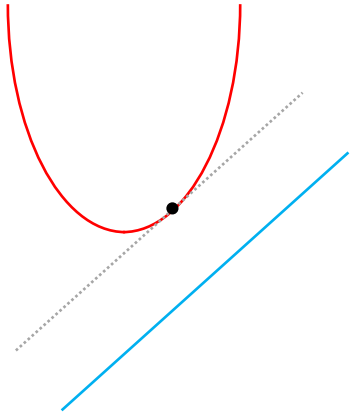
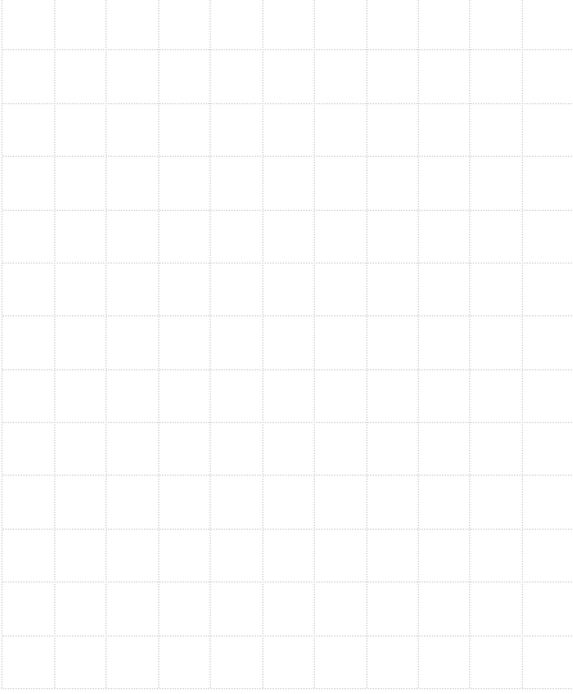
**Soru 3**

$y = -x^2 + 3x - 1$  parabolünün  $y = 3x - 2$  doğrusuna en yakın noktasının koordinatlarını bulunuz .

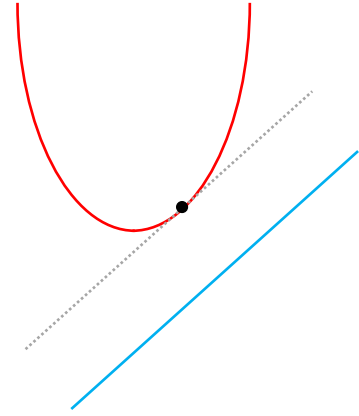
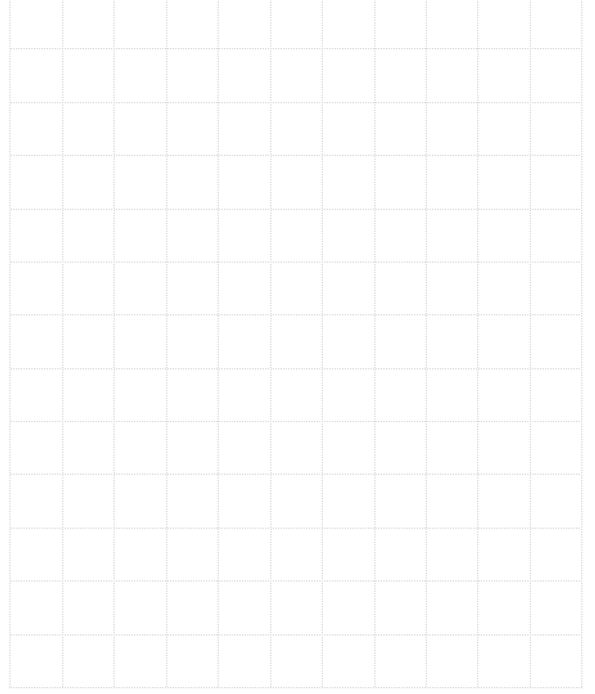


**Soru 4**

$y = x^2 - 3x - 2$  parabolünün  $y = x - 3$  doğrusuna en yakın noktasının koordinatlarını bulunuz .

**Soru 5**

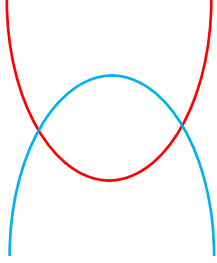
$y = 3x^2 + x$  parabolüne hangi noktadan çizilen teğet  $y = 7x - 10$  doğrusuna paralel olur ?



## İki Parabolle Düzlemdeki Durumu

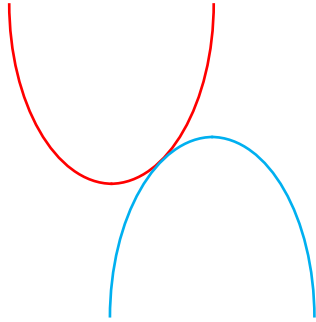
1

$$\Delta > 0$$



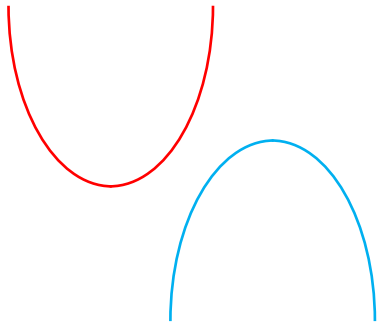
2

$$\Delta = 0$$



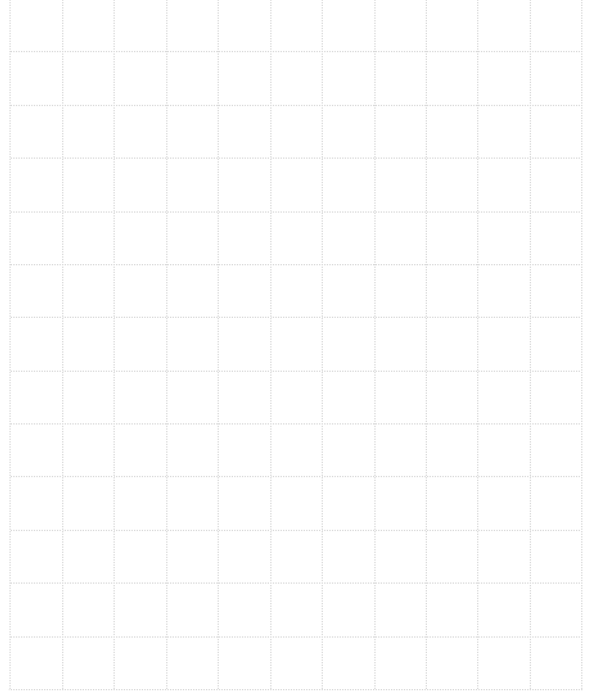
3

$$\Delta < 0$$



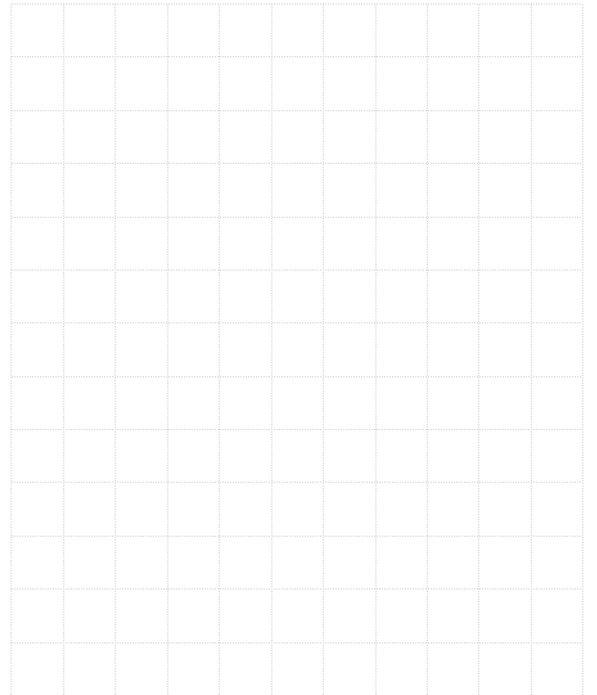
### Soru 1

$y = -3x^2 + x + 1$  ve  $y = x^2 - 3x - 7$  parabollerinin kaç farklı noktada kesiştiklerini bulunuz.



### Soru 2

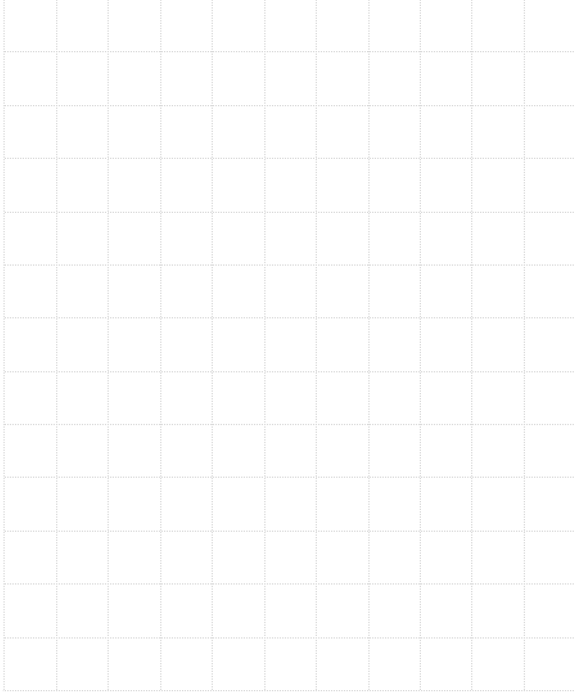
$y = 2x^2 - 3x + 6$  ve  $y = x^2 + x + 2$  parabollerinin kaç farklı noktada kesiştiklerini bulunuz.





**Soru 3**

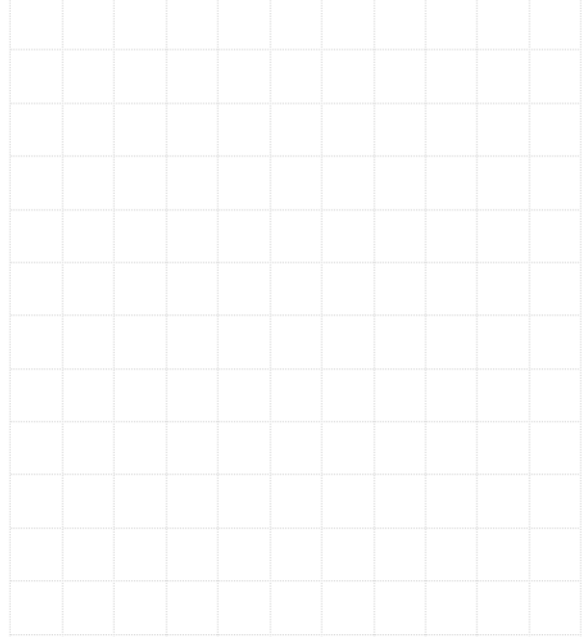
$y = x^2 + 6x + 8$  ve  $y = -x^2 + x + 5$  parabollerinin kaç farklı noktada kesiştiklerini bulunuz .

**Soru 4**

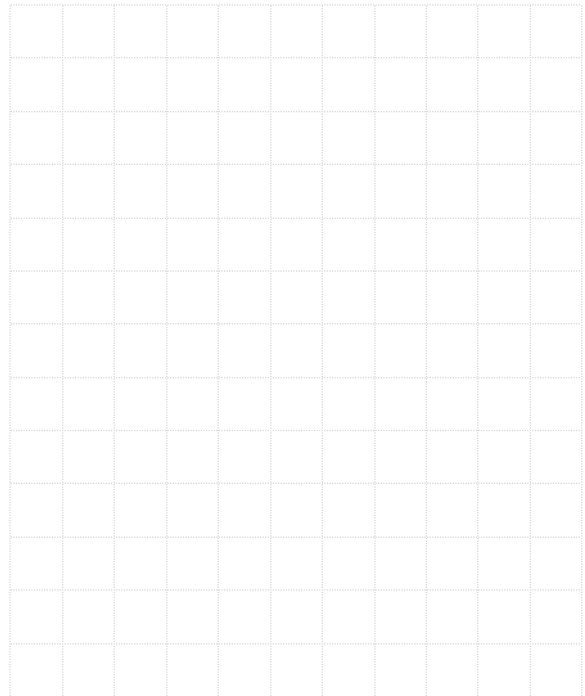
$y = -3x^2 + x + 1$  ve  $y = x^2 - 3x - 7$  parabolleri A ve B noktalarında kesişmektedir . Buna göre , bu iki noktanın koordinatlarını bulunuz .

**Soru 5**

$y = 3x^2 + 6x - 25$  ve  $y = x^2 + 2x + 5$  parabolleri A ve B noktalarında kesişmektedir . Buna göre , bu iki noktanın koordinatlarını bulunuz .

**Soru 6**

$y = 2x^2 - 3x + 6$  ve  $y = x^2 + x + 2$  birbirlerine teğet iki paraboldür . Buna göre , teğet oldukları noktanın koordinatlarını bulunuz .



**Soru 7**

$y = 5x^2 + 7x - m$  ve  $y = 4x^2 + 5x - 1$  parabolleri iki farklı noktada kesiştiklerine göre ,  $m$  'nin alabileceği en küçük tamsayı değeri kaçtır ?

**Soru 8**

$y = 2x^2 + 8x + 10$  ve  $y = x^2 - 2x + m$  parabolleri iki farklı noktada kesiştiklerine göre ,  $m$  en az kaç olabilir ?

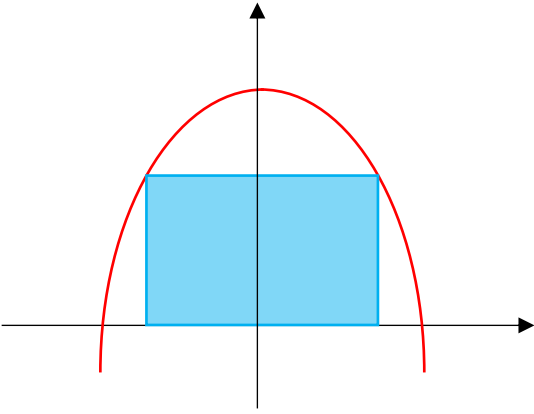
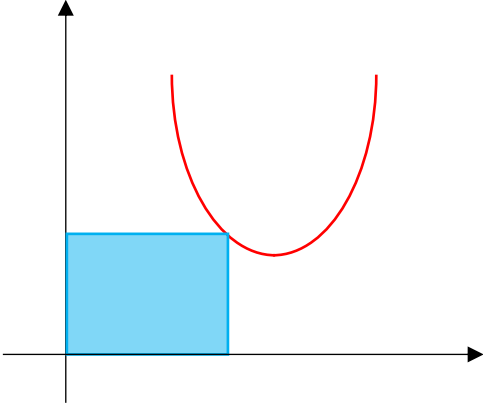
**Soru 9**

$y = 3x^2 + 10x + m$  ve  $y = 2x^2 + 4x - 1$  parabolleri birbirlerine teğet olduklarına göre ,  $m$  kaçtır ?

**Soru 10**

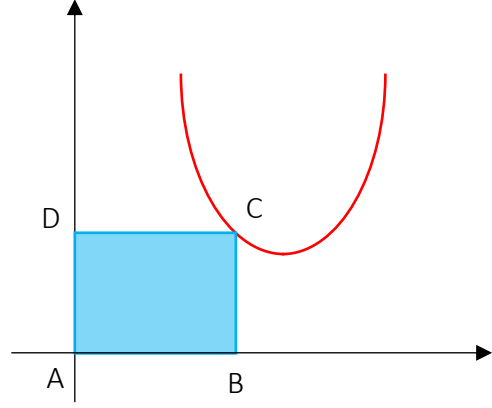
$y = 2x^2 + x + 6$  ve  $y = x^2 - x - m$  parabolleri kesişmediklerine göre ,  $m$  'nin alabileceği en küçük değer kaçtır ?

## Parabol ve Dikdörtgen



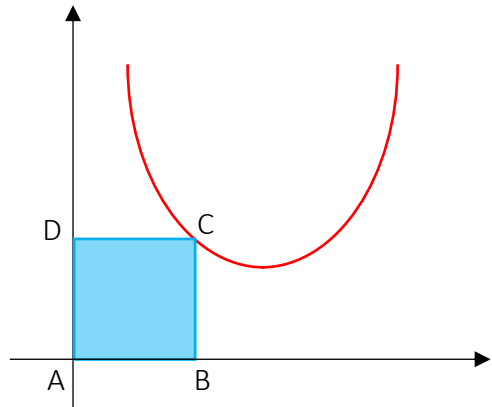
### Soru 1

Aşağıdaki şekilde ABCD dikdörtgeni ve  $y = x^2 - 8x - 12$  parabolü verilmiştir . B noktasının apsisi 10 olduğuna göre , A (ABCD) kaç  $br^2$  dir ?



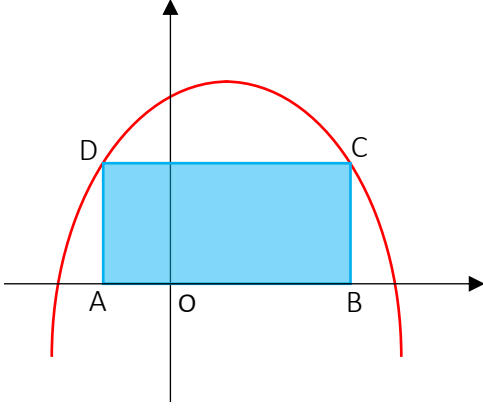
### Soru 2

Aşağıdaki şekilde ABCD dikdörtgeni ve  $y = x^2 - 6x - 6$  parabolü verilmiştir . B noktasının apsisi 8 olduğuna göre , A (ABCD) kaç  $br^2$  dir ?

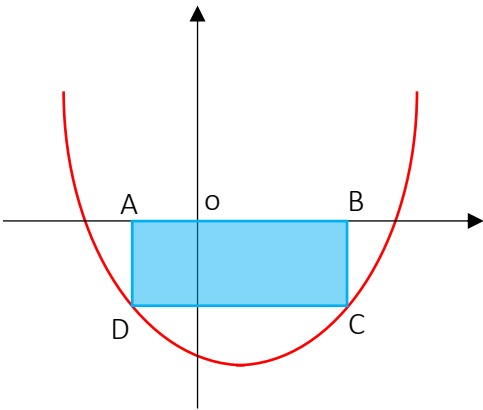


**Soru 3**

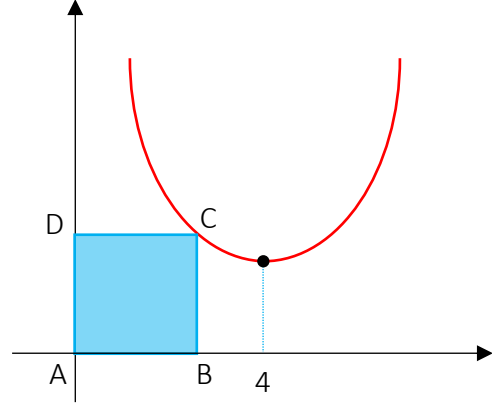
Aşağıdaki şekilde ABCD dikdörtgeni ve  $y = -x^2 + 10x - 1$  parabolü verilmiştir .  
 $B = (9, 0)$  ve  $|OB| = 3 \cdot |AO|$  olduğuna göre ,  
A (ABCD) kaç  $br^2$  dir ?

**Soru 4**

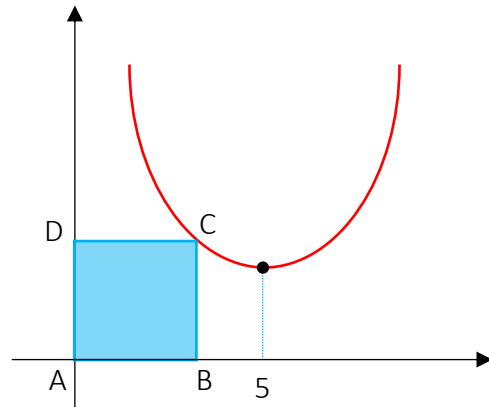
Aşağıdaki şekilde ABCD dikdörtgeni ve  $y = x^2 - 12x + 16$  parabolü verilmiştir .  
 $B = (10, 0)$  ve  $|OB| = 2 \cdot |AO|$  olduğuna göre ,  
A (ABCD) kaç  $br^2$  dir ?

**Soru 5**

Aşağıdaki şekilde ABCD karesi ve  $y = x^2 - 8x + 18$  parabolü verilmiştir .  
Buna göre , A (ABCD) kaç  $br^2$  dir ?

**Soru 6**

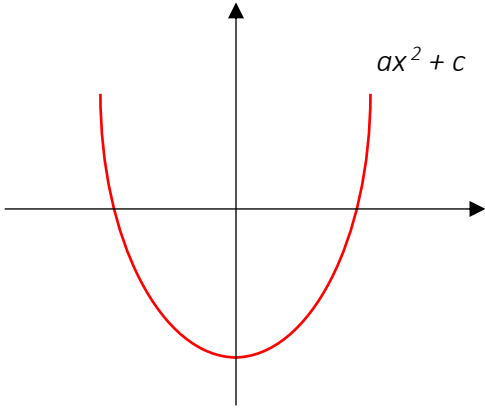
Aşağıdaki şekilde ABCD karesi ve  $y = x^2 - 10x + 28$  parabolü verilmiştir .  
Buna göre , A (ABCD) kaç  $br^2$  dir ?



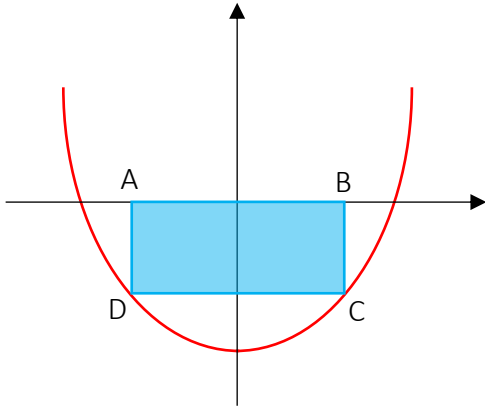
**NOT :**

$$f(x) = ax^2 + bx + c \quad , \quad b = 0 \quad \text{ise}$$

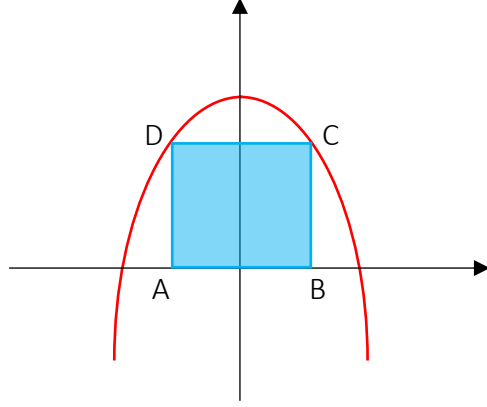
$f(x)$  parabolü y eksenine göre simetrik olur .

**Soru 7**

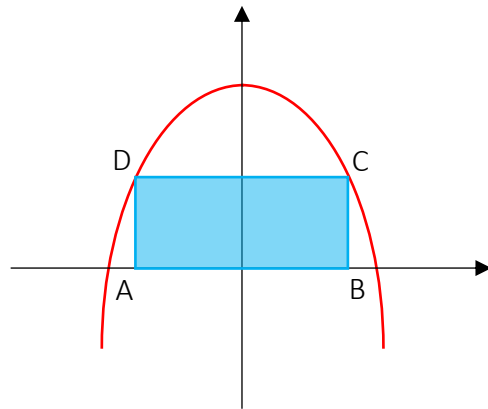
Aşağıdaki şekilde ABCD dikdörtgeni ve  $y = x^2 - 16$  parabolü verilmiştir . B noktasının apsisi 3 olduğuna göre , A (ABCD) kaç  $br^2$  dir ?

**Soru 8**

Aşağıdaki şekilde ABCD karesi ve  $y = -x^2 + 8$  parabolü verilmiştir . Buna göre , A (ABCD) kaç  $br^2$  dir ?

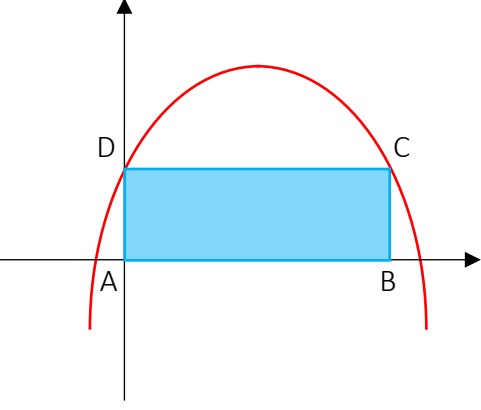
**Soru 9**

Aşağıdaki şekilde ABCD dikdörtgeni ve  $y = -x^2 + 16$  parabolü verilmiştir . C noktasının ordinatı 7 olduğuna göre , A (ABCD) kaç  $br^2$  dir ?



### Soru 10

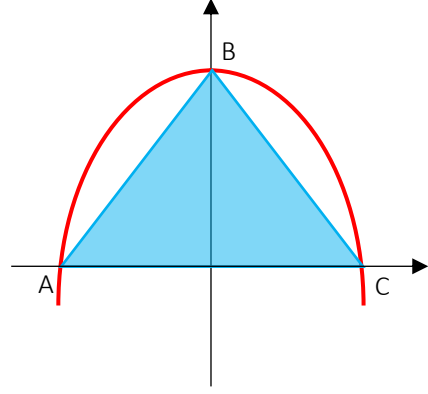
Aşağıdaki şekilde ABCD dikdörtgeni ve  $y = -x^2 + 10x + 20$  parabolü verilmiştir . Buna göre , A (ABCD) kaç  $br^2$  dir ?



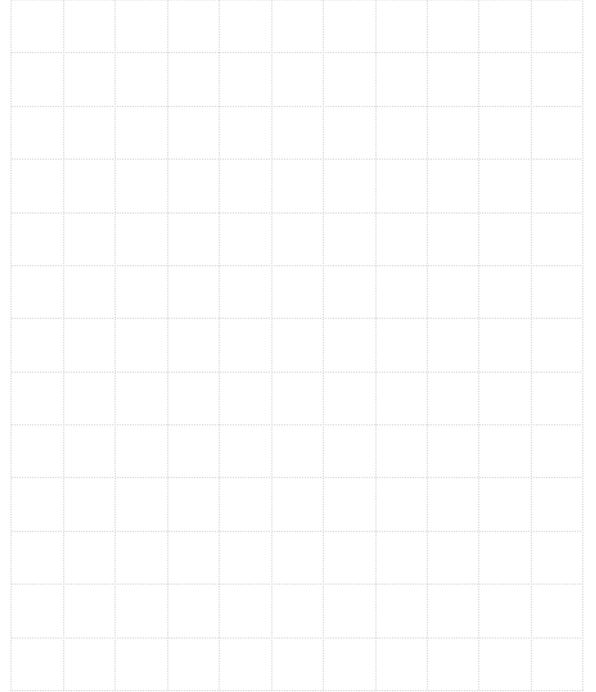
## Parabol ve Üçgen

### Soru 1

Aşağıdaki şekilde  $y = -x^2 + 16$  parabolünün grafiği verilmiştir . Buna göre , ABC üçgeninin alanı kaç  $br^2$  dir ?

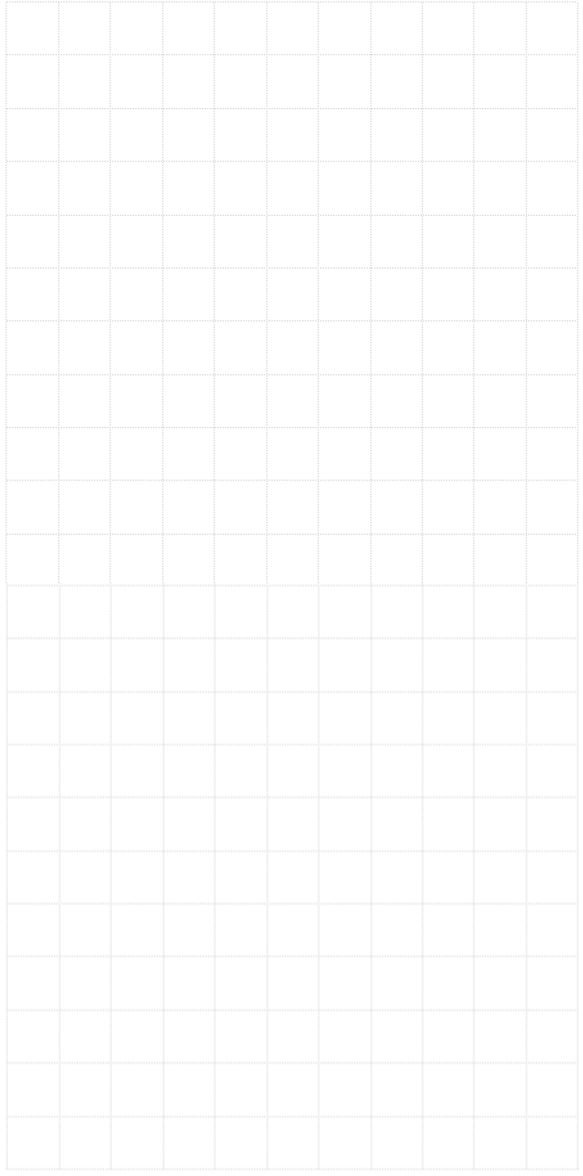
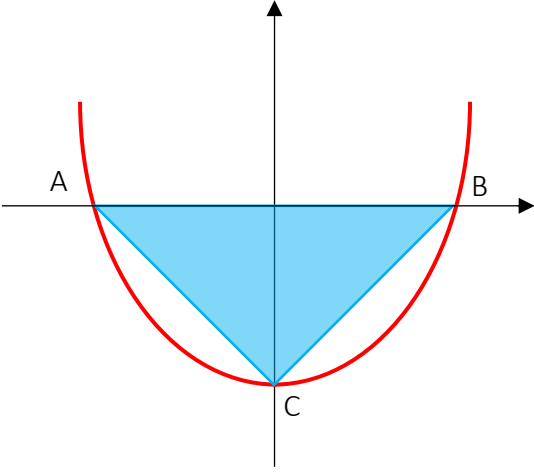


ODTÜ LÜ HOCAM

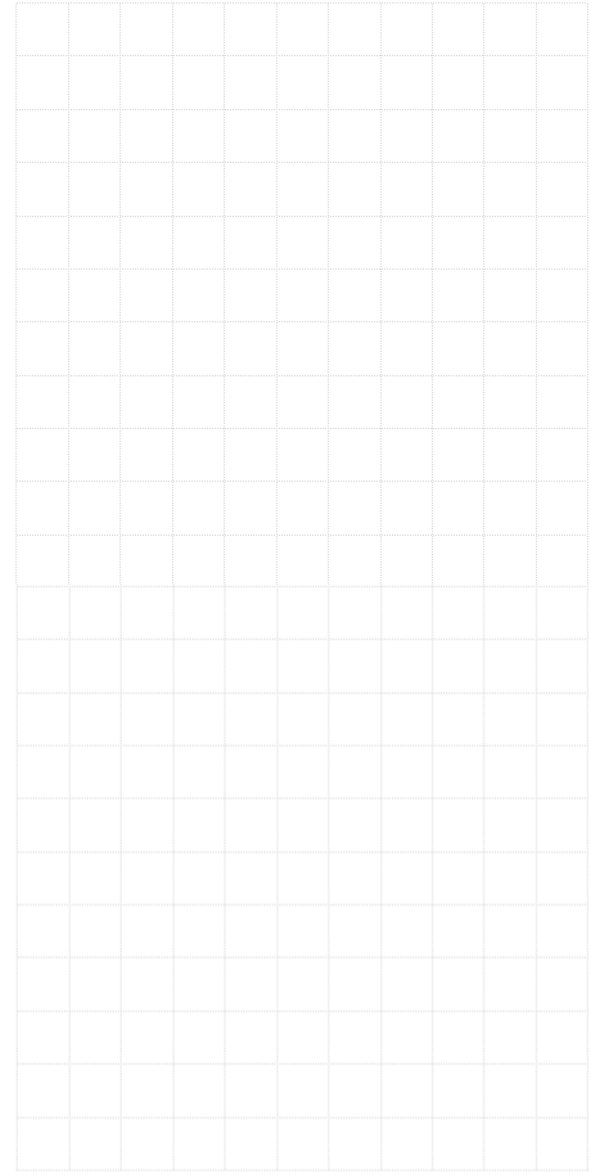
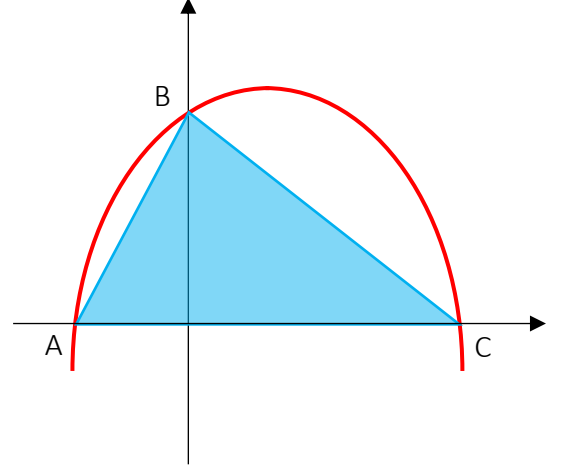


**Soru 2**

Aşağıdaki şekilde  $y = x^2 - 9$  parabolünün grafiği verilmiştir . Buna göre , ABC üçgeninin alanı kaç  $br^2$  dir ?

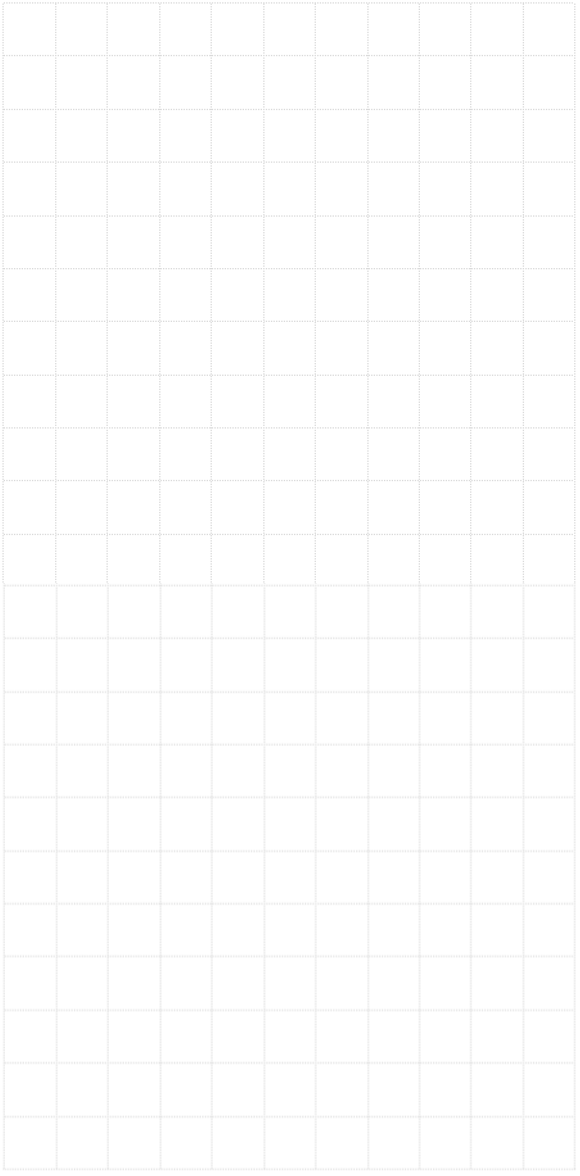
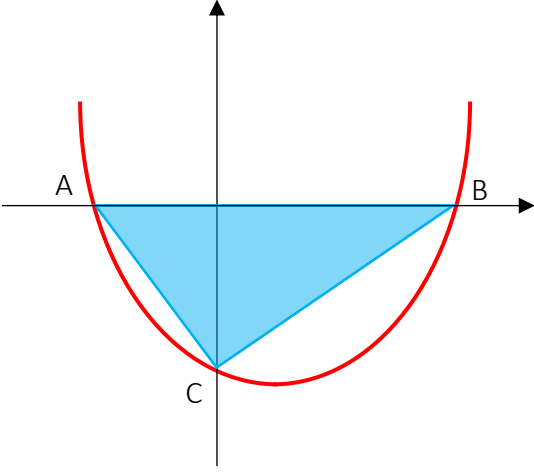
**Soru 3**

Aşağıdaki şekilde  $y = -x^2 + 8x + 20$  parabolünün grafiği verilmiştir . Buna göre , ABC üçgeninin alanı kaç  $br^2$  dir ?

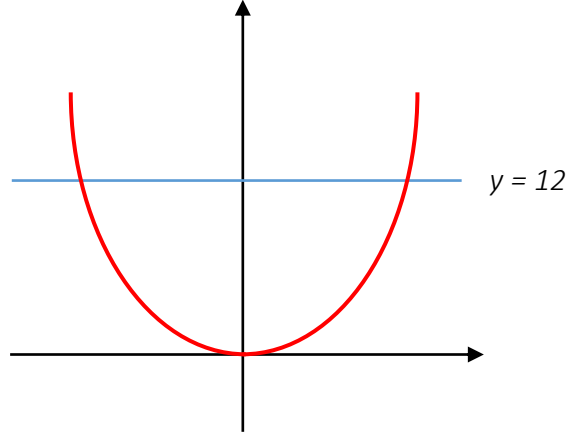


**Soru 4**

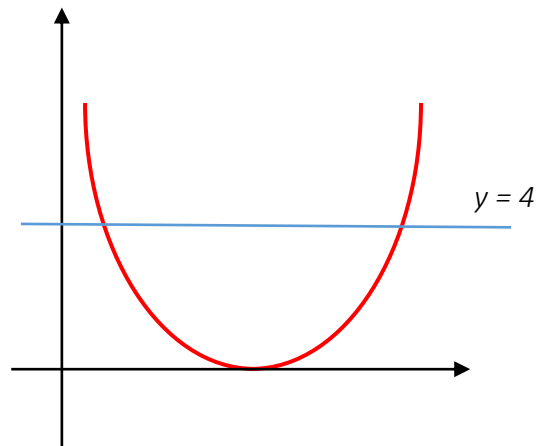
Aşağıdaki şekilde  $y = x^2 - 8x - 20$  parabolünün grafiği verilmiştir . Buna göre , ABC üçgeninin alanı kaç  $br^2$  dir ?

**Örnek**

$y = 3x^2$  parabolü ile  $y = 12$  doğrusunun kesişme noktalarını bulunuz .

**Örnek**

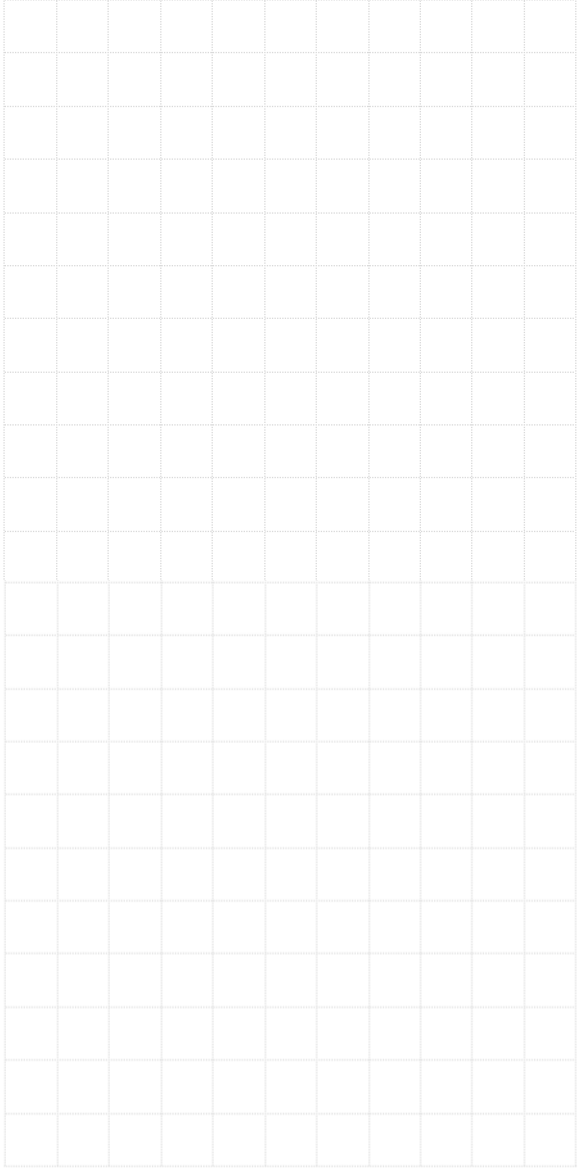
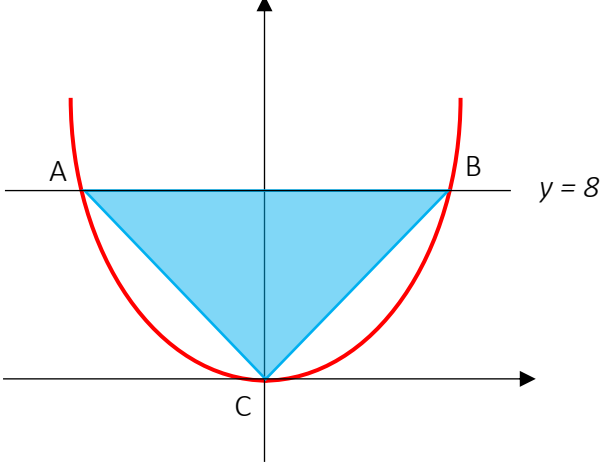
$y = x^2 - 8x + 16$  parabolü ile  $y = 4$  doğrusunun kesişme noktalarını bulunuz .





**Soru 5**

Aşağıdaki şekilde  $y = 2x^2$  parabolü ile  $y = 8$  doğrusunun grafikleri verilmiştir . Buna göre , ABC üçgeninin alanı kaç  $br^2$  dir ?

**Soru 6**

Aşağıdaki şekilde  $y = x^2 - 4x + 4$  parabolü ile  $y = 9$  doğrusunun grafikleri verilmiştir . Buna göre , ABC üçgeninin alanı kaç  $br^2$  dir ?

