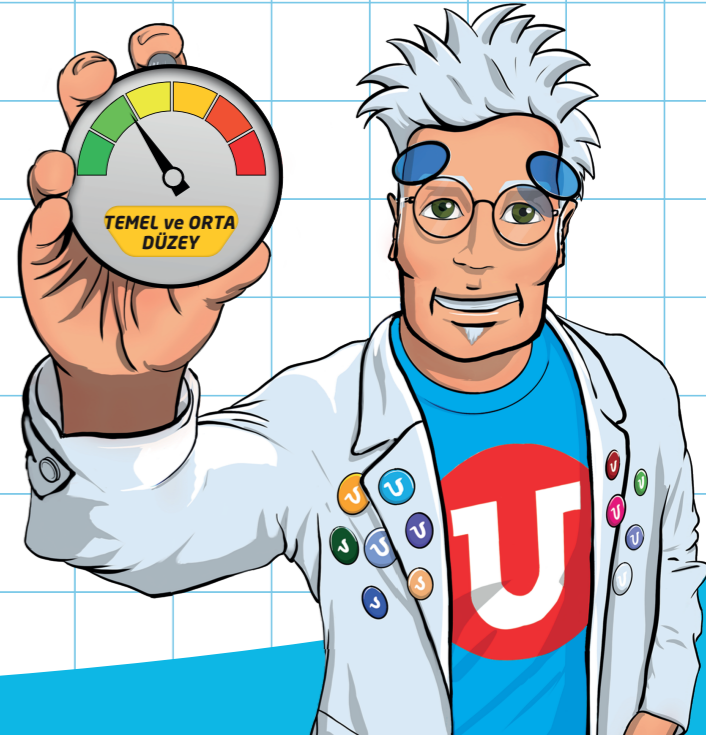


1.ÜNİTE

U

# AYT Temel ve Orta Düzey Fizik Soru Bankası

## Vektörler



ABONE  
OL

OKTAY KURT

# VEKTÖRLER

**VEKTÖRLERİN BİLEŞKESİ**

**VEKTÖRLERİN BİLEŞENLERİNE AYRILMASI**

**BİLEŞKENİN ÖZELLİKLERİ**

**NOKTASAL CİSİMLERİN DENGESİ**

**VEKTÖRLERDE ÇIKARMA İŞLEMİ**

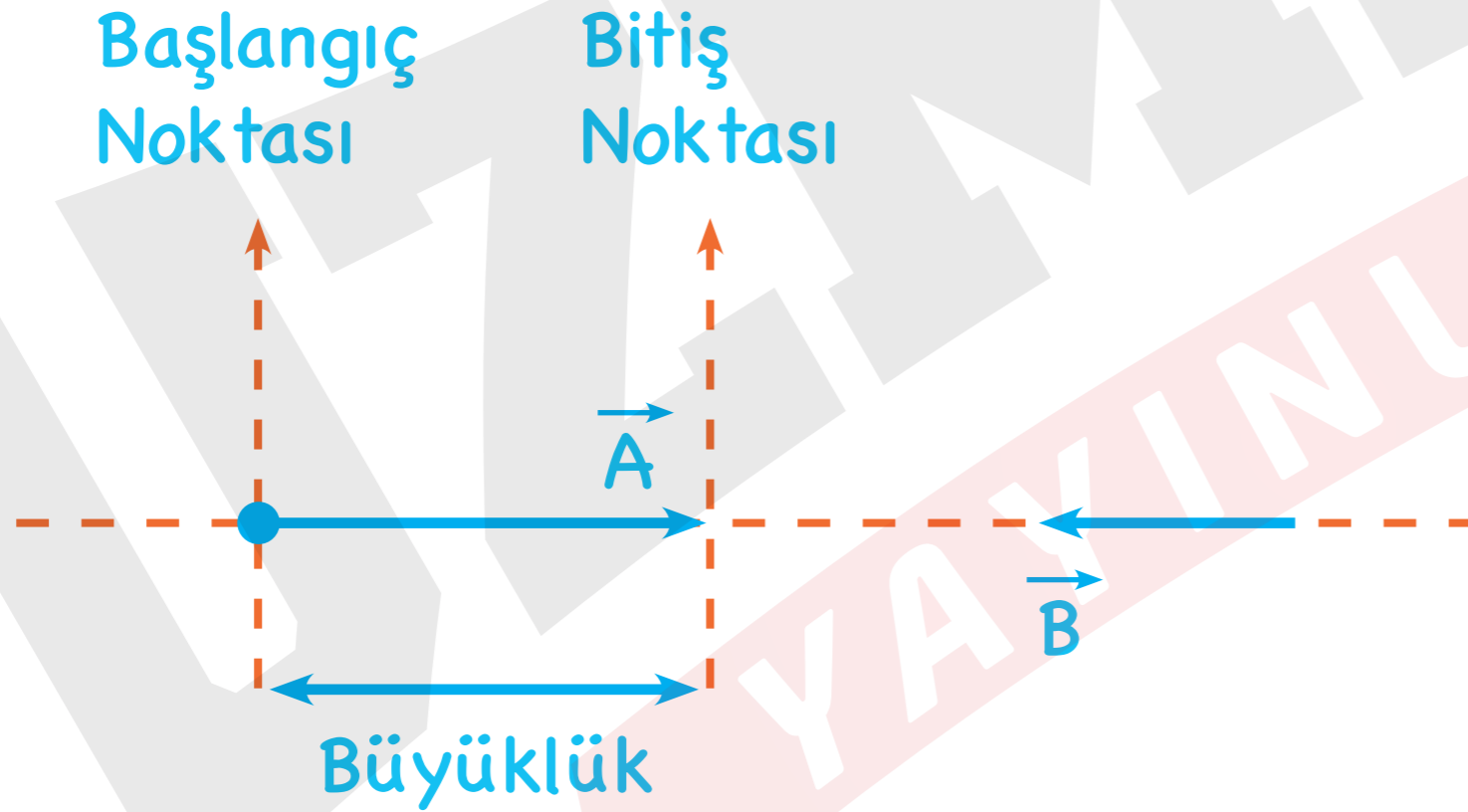
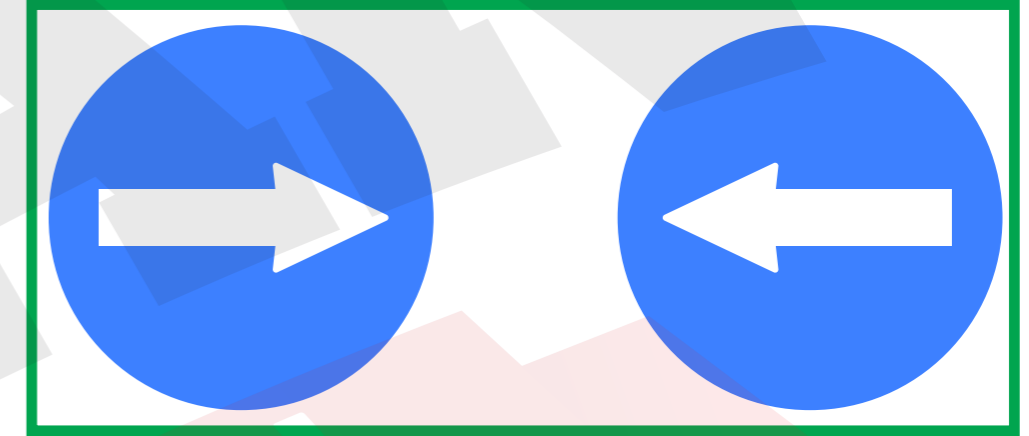
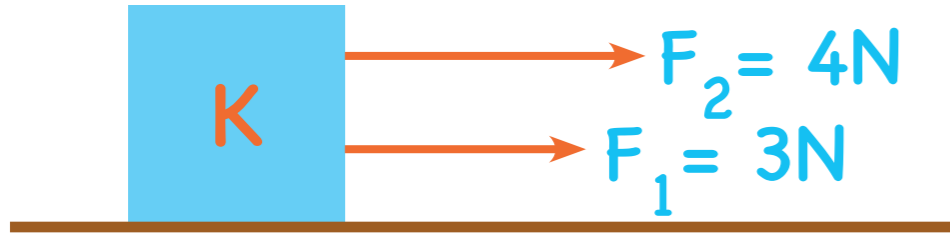
# Vektörler



- Ayt'de son üç yılda hiç soru gelmedi.
- En son 2017 yılında soru geldi.

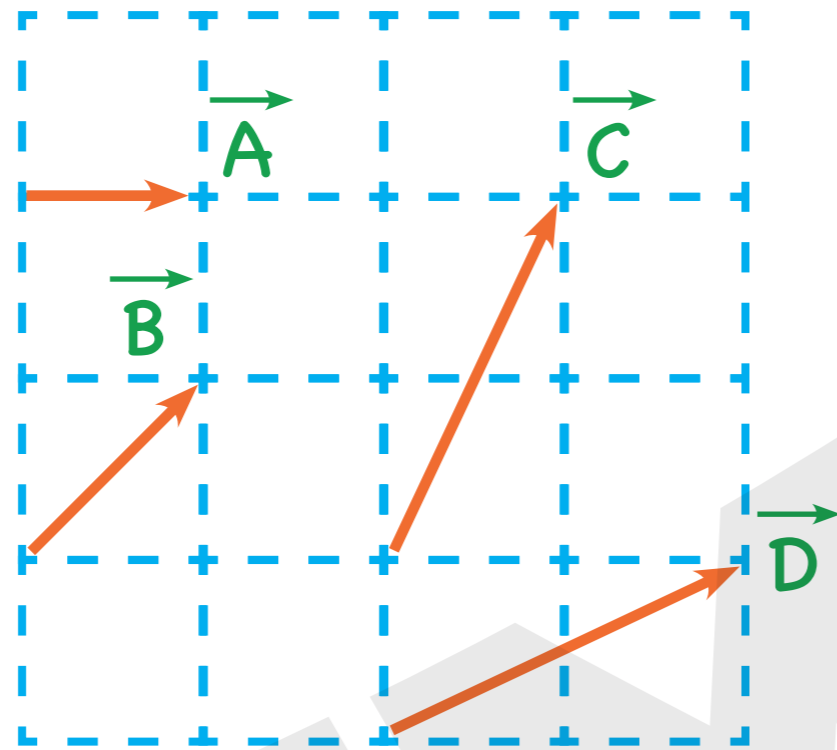
# Vektörler

→ Vektörel büyüklükler vektörle gösterilir.



$$|\vec{A}| = A = A \text{ nın büyüklüğü}$$

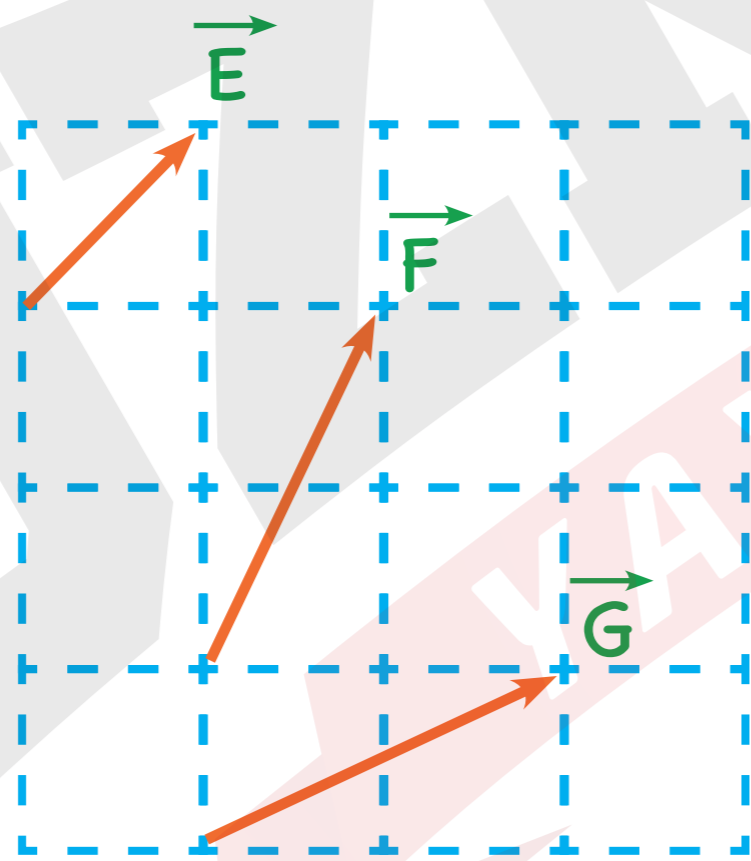




$$A < B$$

$$|\vec{B}| < |\vec{C}|$$

$$C = D$$

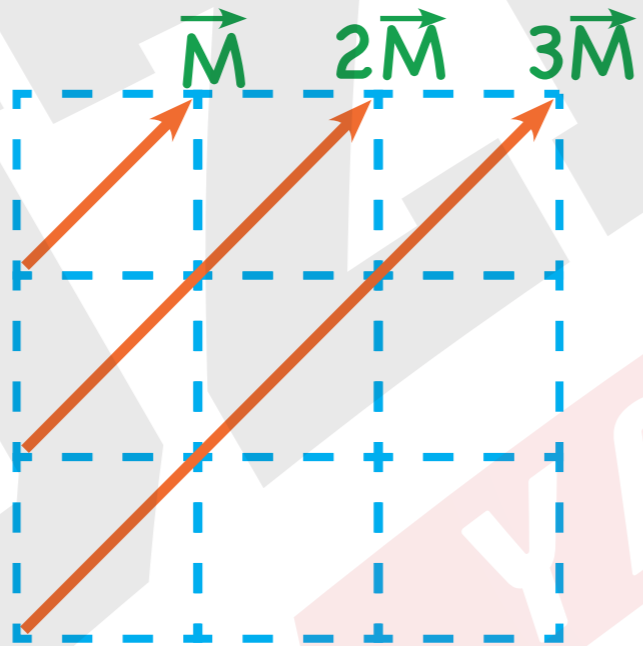
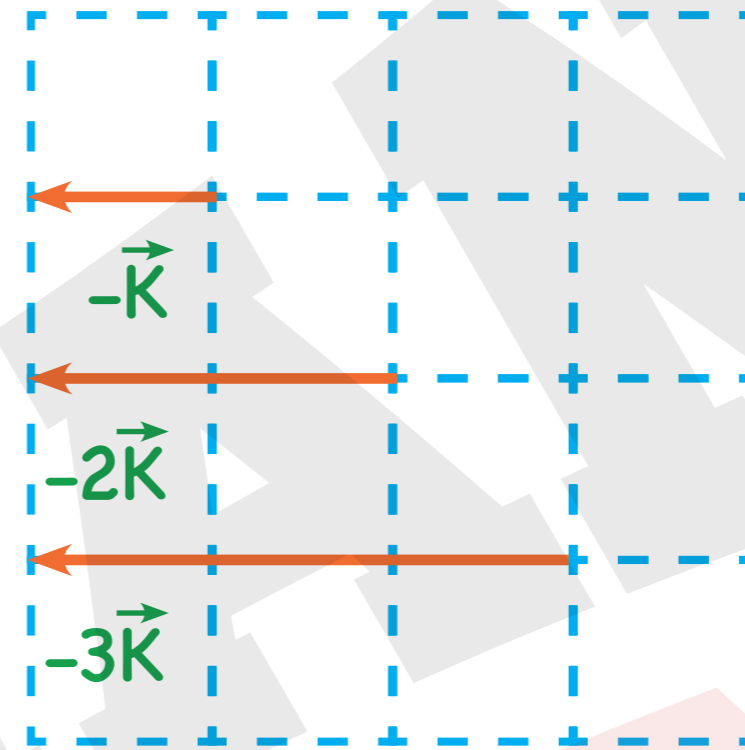
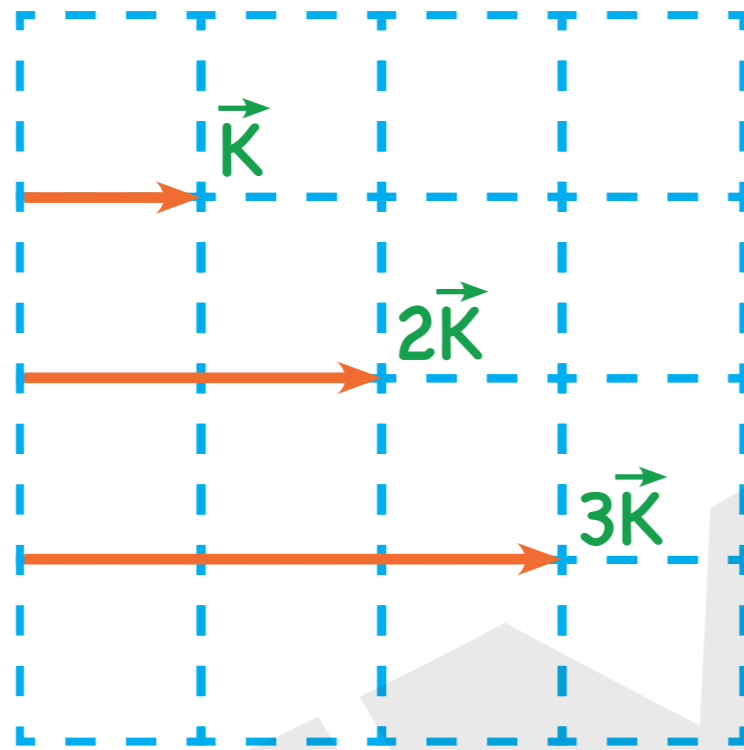


$$\vec{B} = \vec{E}$$

$$\vec{C} = \vec{F}$$

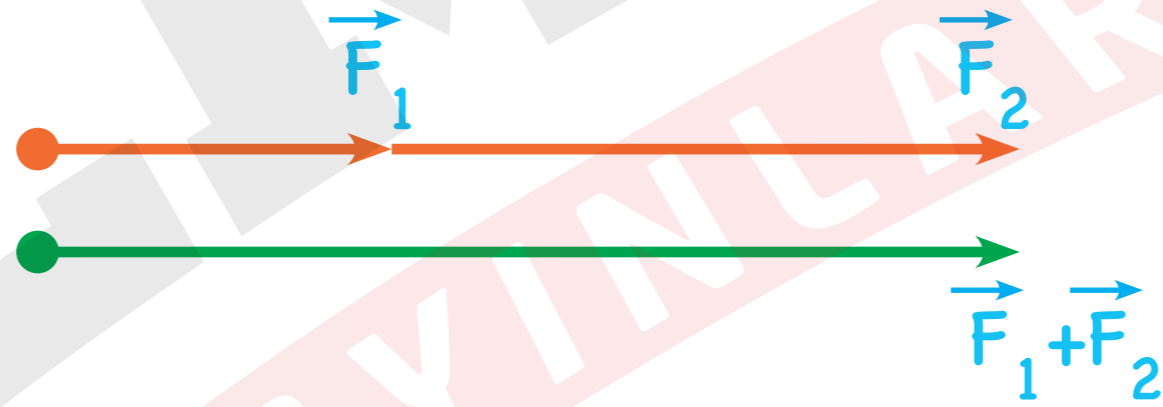
$$\vec{D} = \vec{G}$$

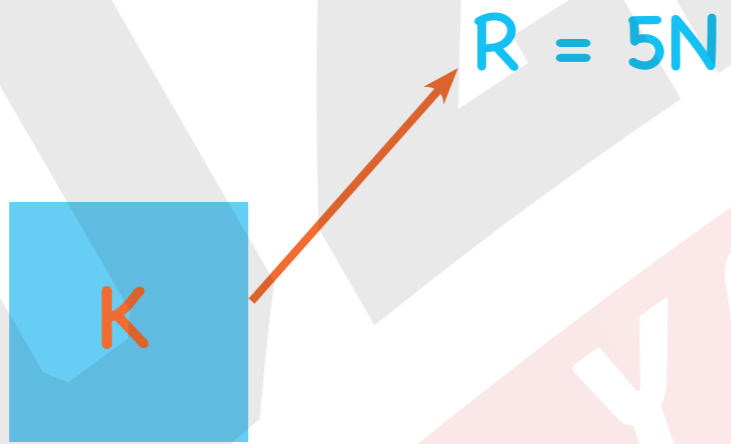
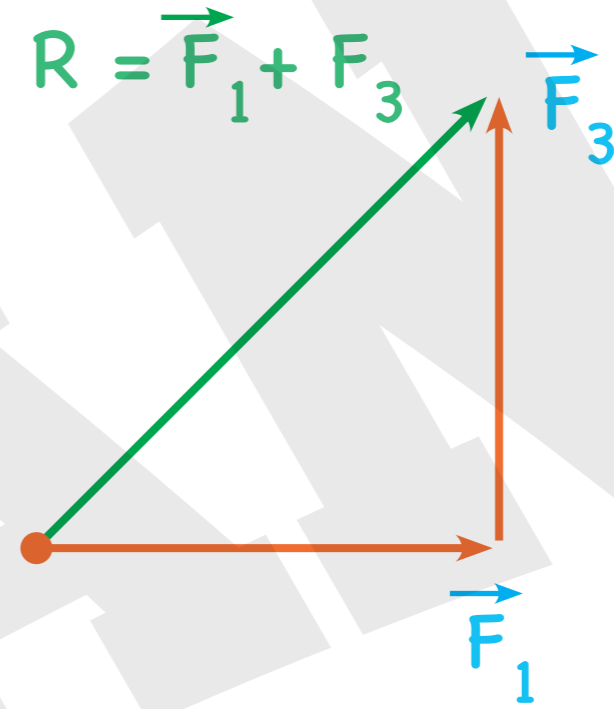
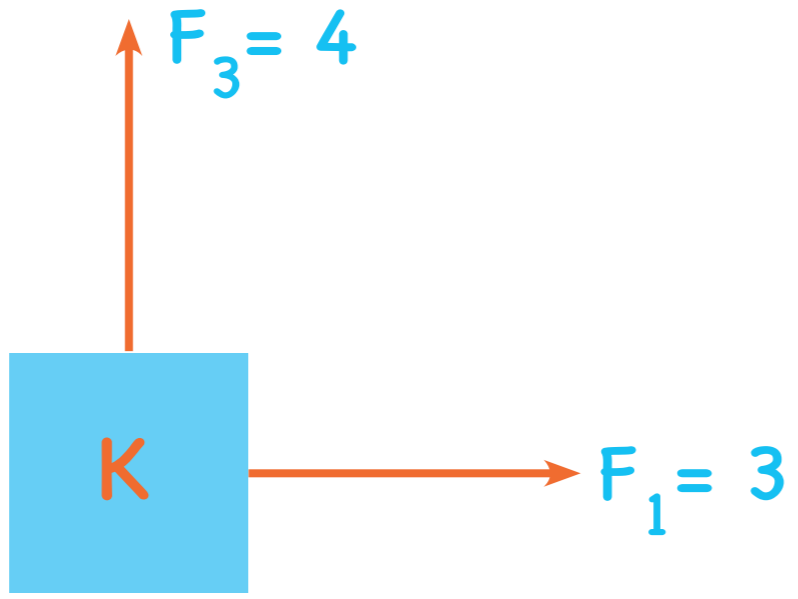




YAYINLARI

# Vektörlerin Bileşkesi

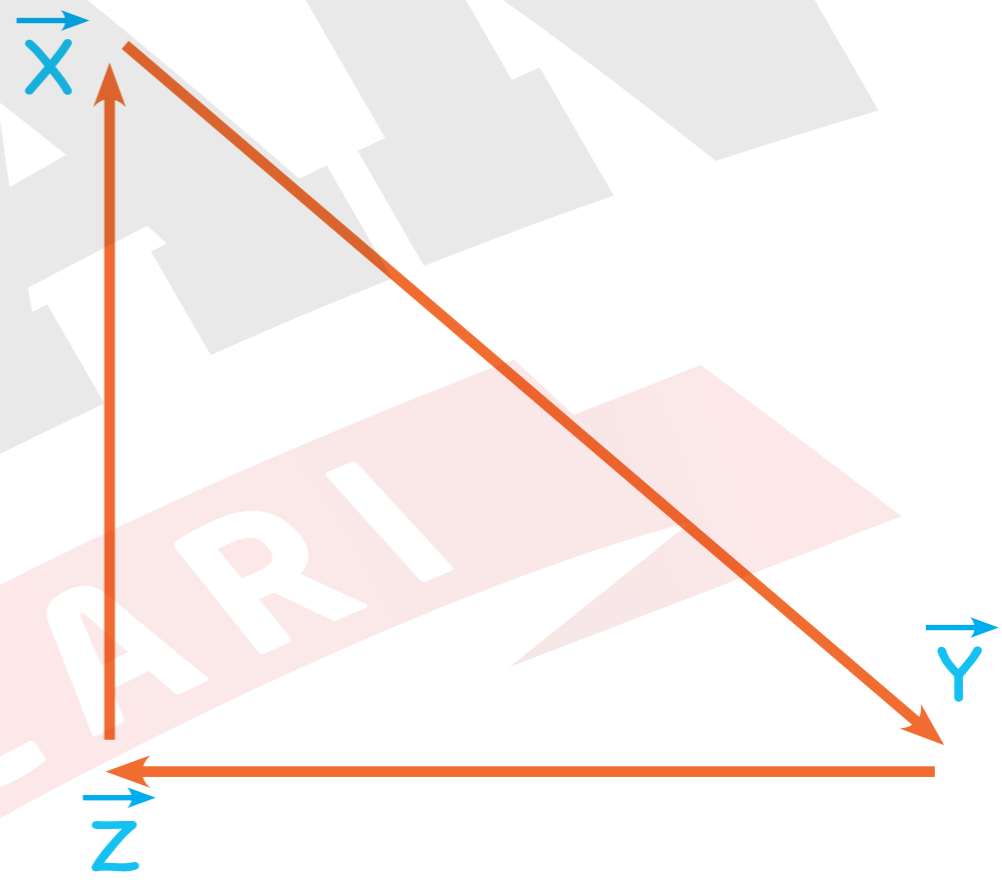
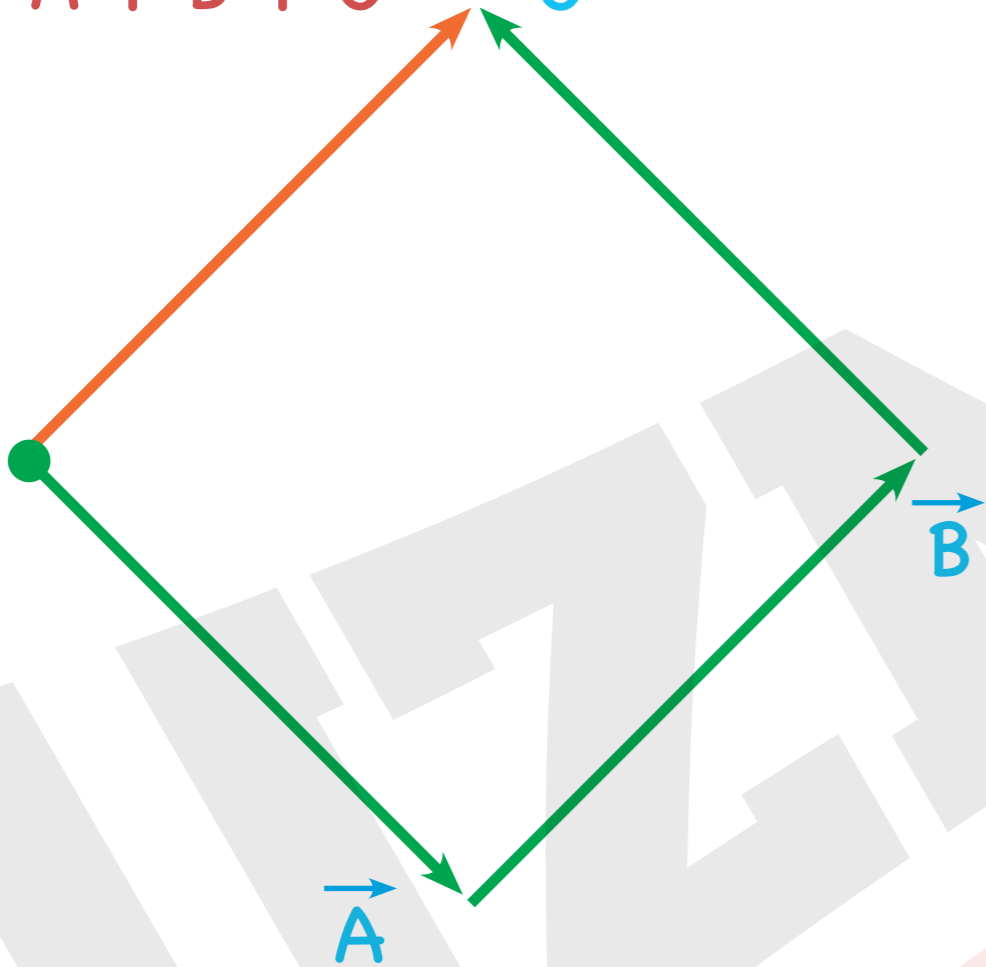




YAYINLARI



$$\vec{A} + \vec{B} + \vec{C}$$



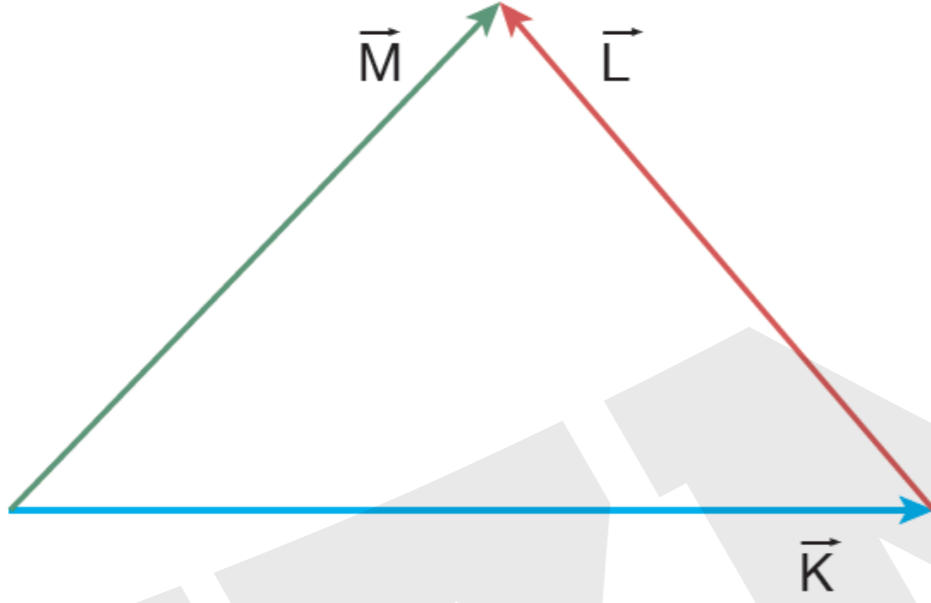
$$\vec{X} + \vec{Y} + \vec{Z} = 0$$

$$\vec{Y} + \vec{Z} + \vec{X} = 0$$



## Örnek:

Sayfa düzlemindeki  $\vec{K}$ ,  $\vec{L}$ ,  $\vec{M}$  vektörleri şekildeki gibidir.



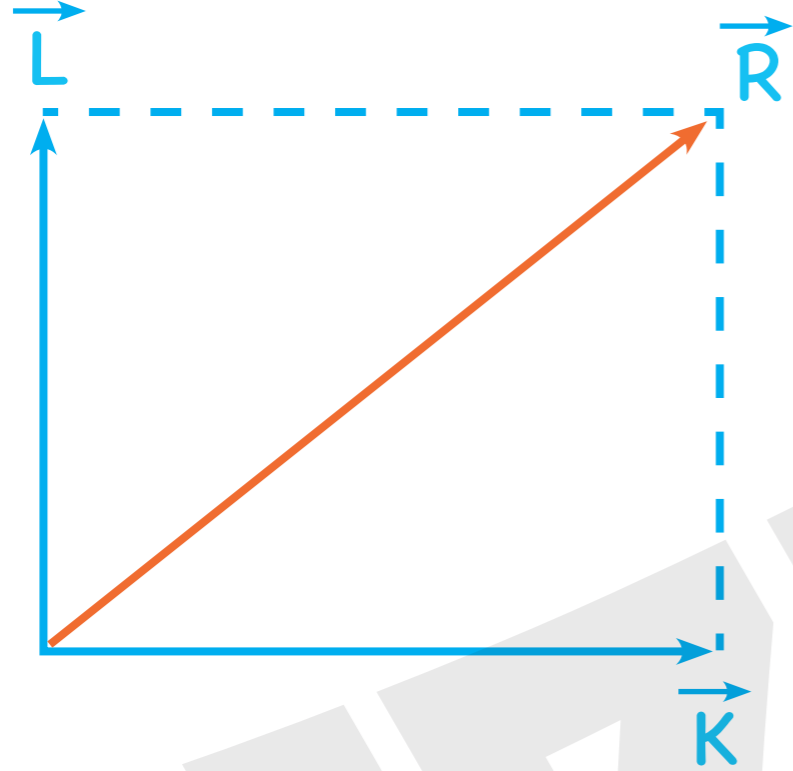
Buna göre,

- I.  $\vec{K} + \vec{L} = \vec{M}$
- II.  $\vec{K} + \vec{M} = \vec{L}$
- III.  $\vec{K} + \vec{L} + \vec{M} = 0$

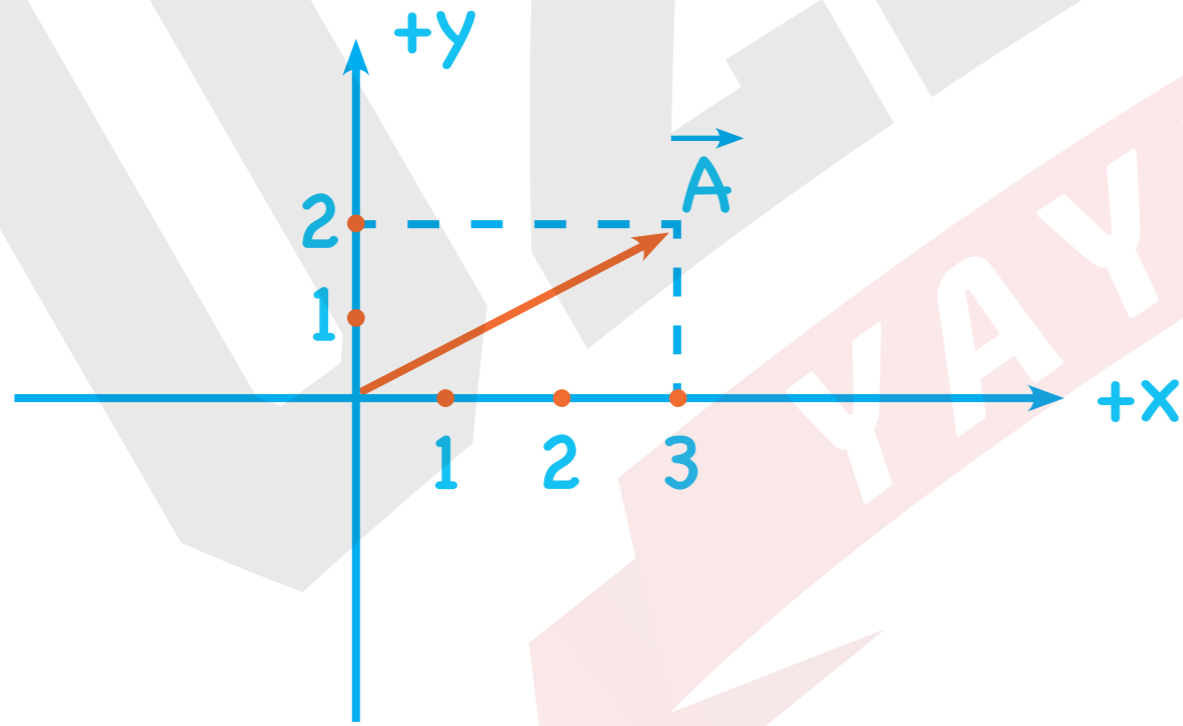
eşitliklerinden hangileri doğrudur?

- A) Yalnız I                      B) I ve II                      C) I ve III  
D) II ve III                      E) I, II ve III

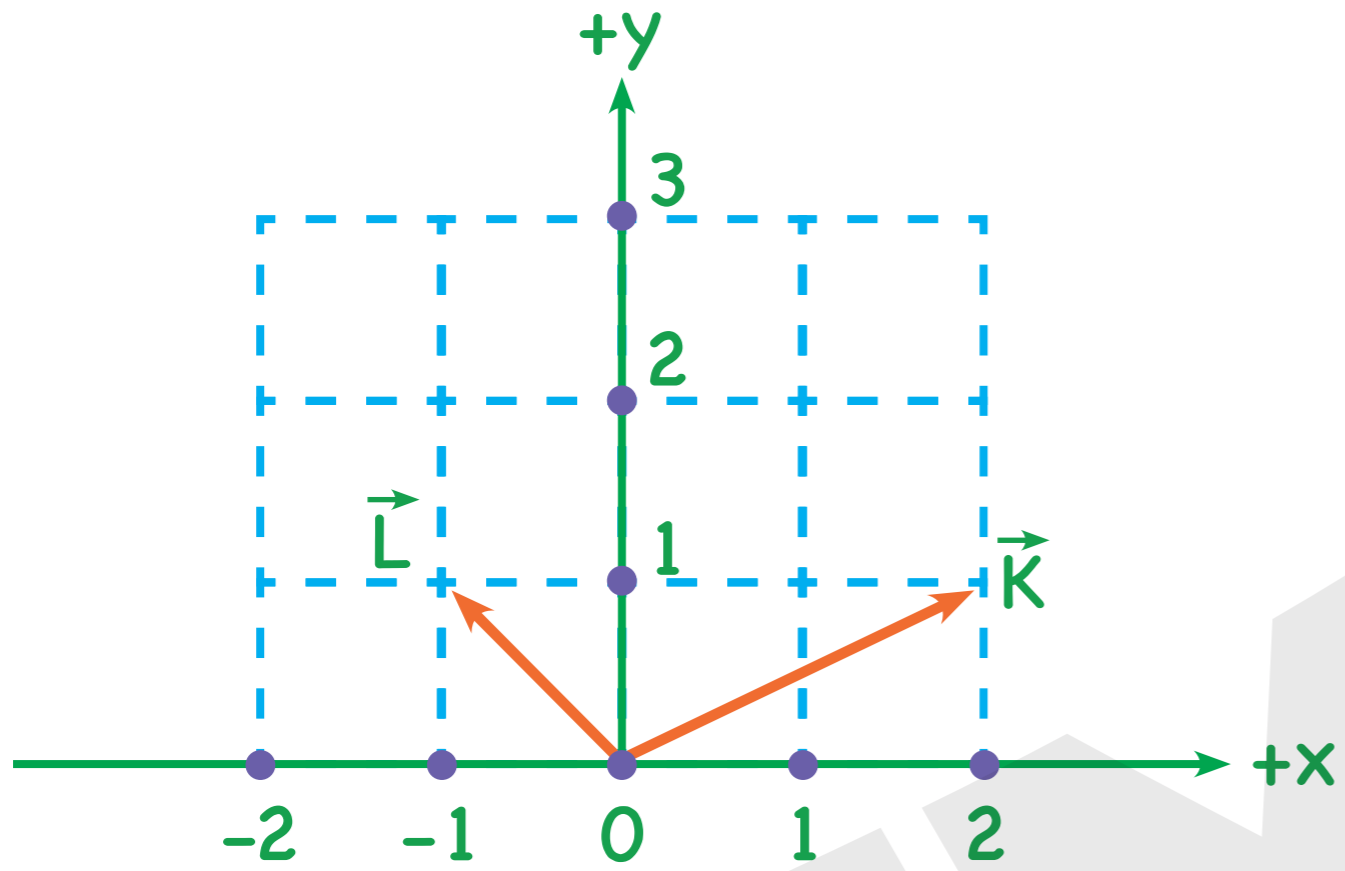
# Vektörlerin Bileşenlerine Ayrılması



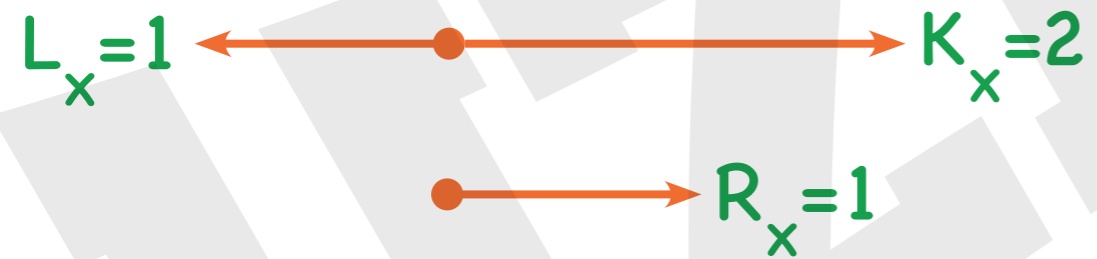
$\vec{R}$ ,  $\vec{K}$  ve  $\vec{L}$  vektörlerinin bileşkesi  
 $\vec{K}$  ve  $\vec{L}$   $\vec{R}$ 'nin bileşenleri



$$\vec{A} = (3,2)$$

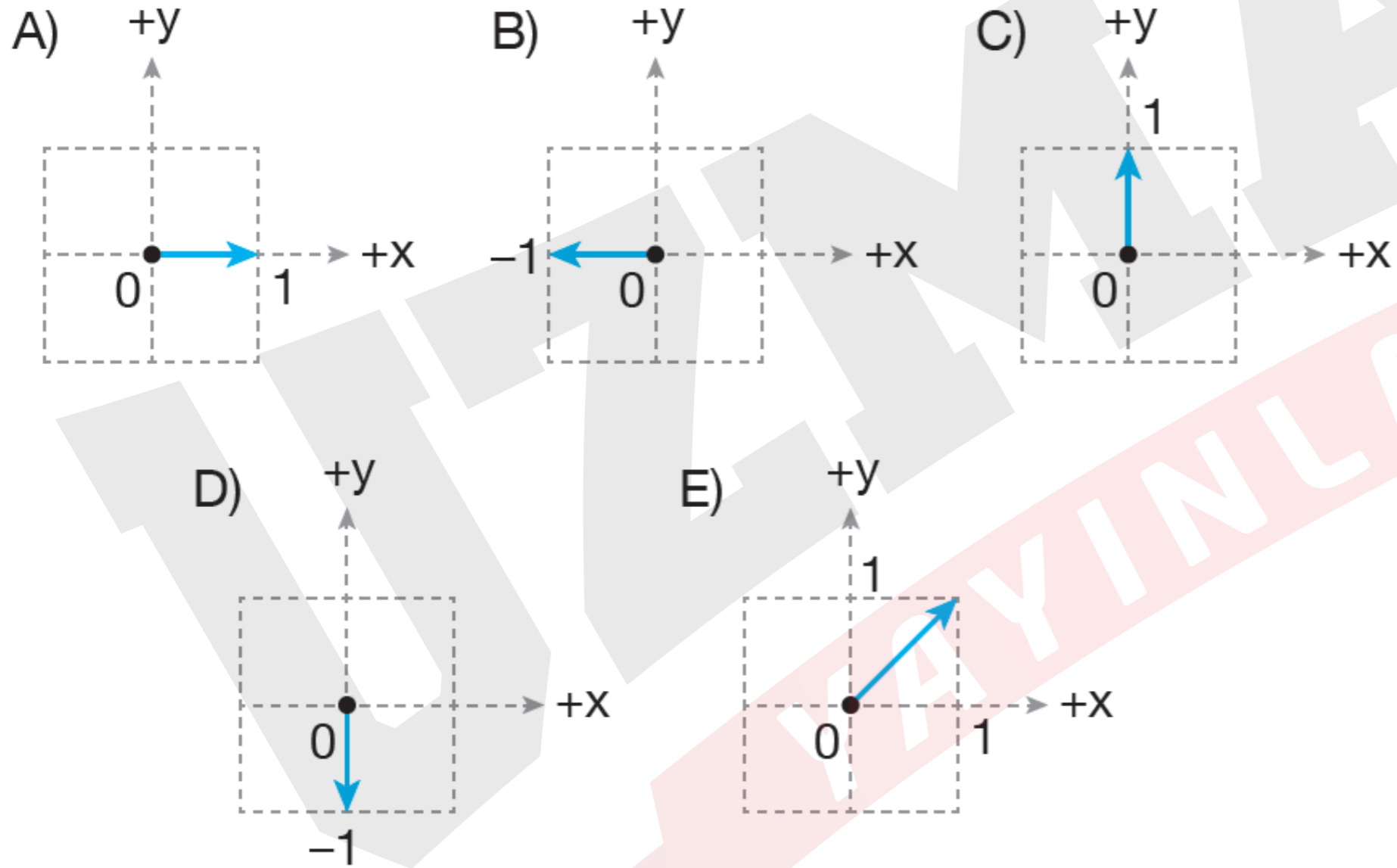


	x	y
$\vec{K}$	2	1
$\vec{L}$	-1	1
$\vec{K} + \vec{L}$	1	2

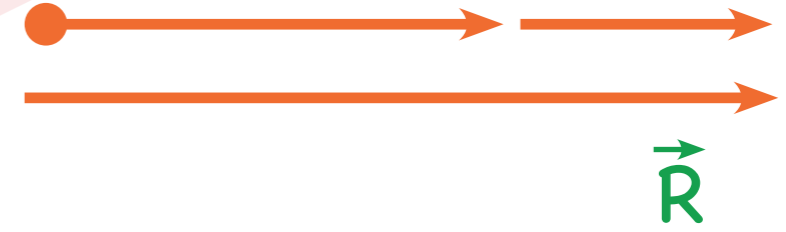
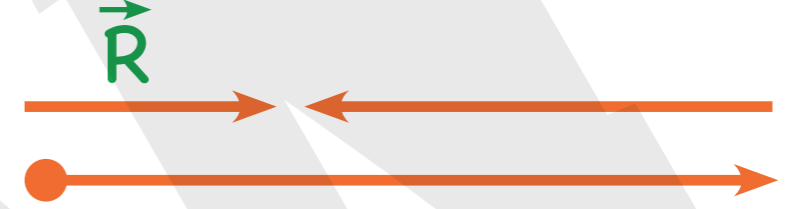


## Örnek:

Koordinatları  $A(2, -2)$  ve  $B(-2, 3)$  olan  $\vec{A}$  ve  $\vec{B}$  vektörlerinin bileşkesi aşağıdakilerden hangisine eşittir?



# BİLEŞKENİN ÖZELLİKLERİ



$$1. K-L \ll R \ll K+L$$

## Örnek:

Büyüklikleri  $3\text{N}$  ve  $7\text{N}$  olan iki kuvvetin bileşkesinin büyüklüğü aşağıdakilerden hangisi olamaz?

A) 4

B) 5

C) 6

D) 10

E) 12

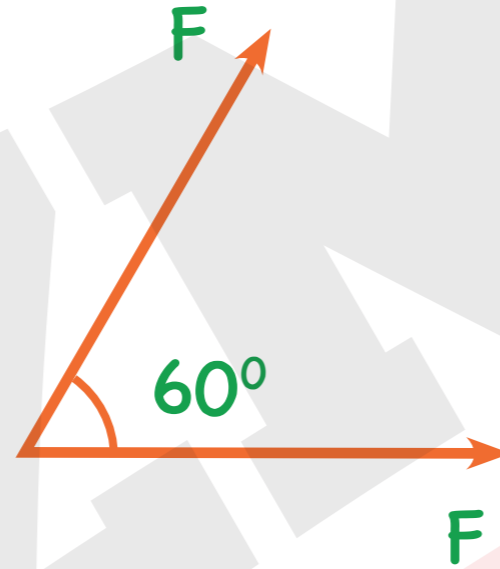
## 2. Büyüklükleri Eşit Vektörlerin Bileşkesi

$$\alpha = 0$$



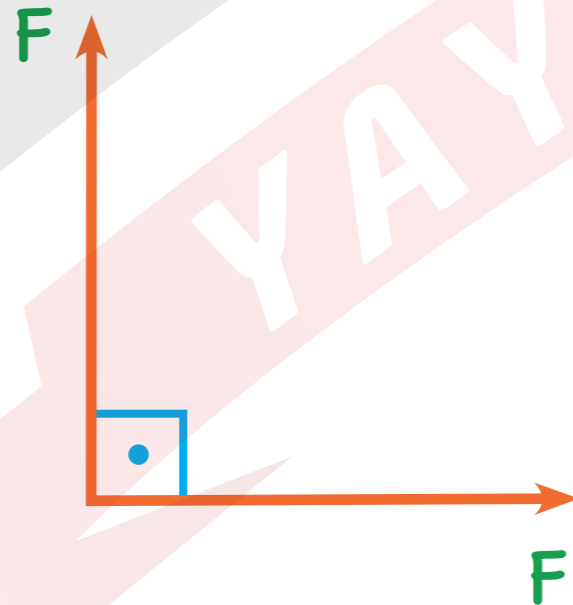
$$R = 2F$$

$$\alpha = 60$$



$$R = \sqrt{3}F$$

$$\alpha = 90^\circ$$

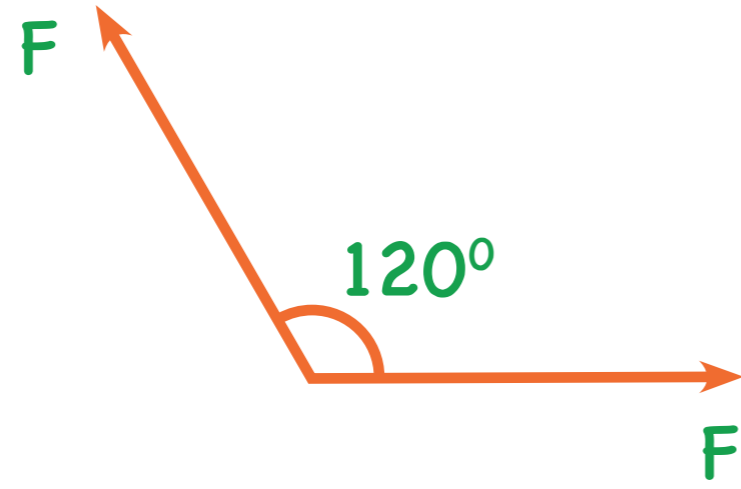


$$R = \sqrt{2}F$$





$\alpha = 120^\circ$



$R = F$

$\alpha = 180^\circ$



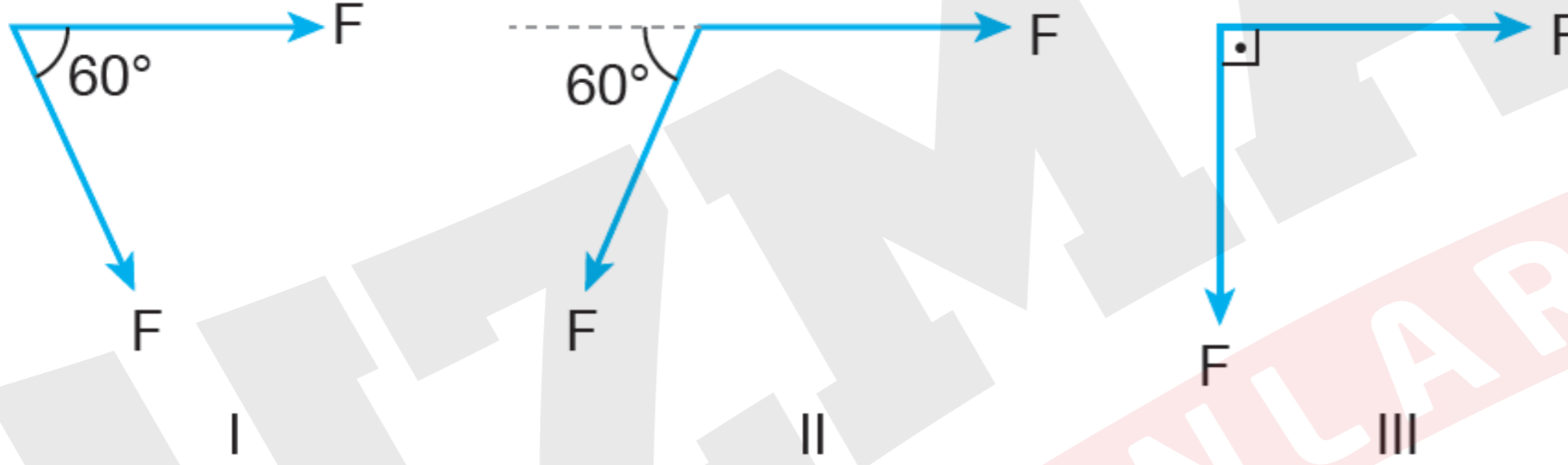
$R = 0$

3.  $\alpha \uparrow$   $R \downarrow$



## Örnek:

Büyüklikleri  $F$  olan şekildeki vektörlerin toplamının büyüklüğü I. durumda  $R_1$ , II. durumda  $R_2$ , III. durumda  $R_3$  tür.



Buna göre  $R_1$ ,  $R_2$ ,  $R_3$  arasındaki ilişki nedir?

A)  $R_1 > R_2 > R_3$

B)  $R_1 > R_3 > R_2$

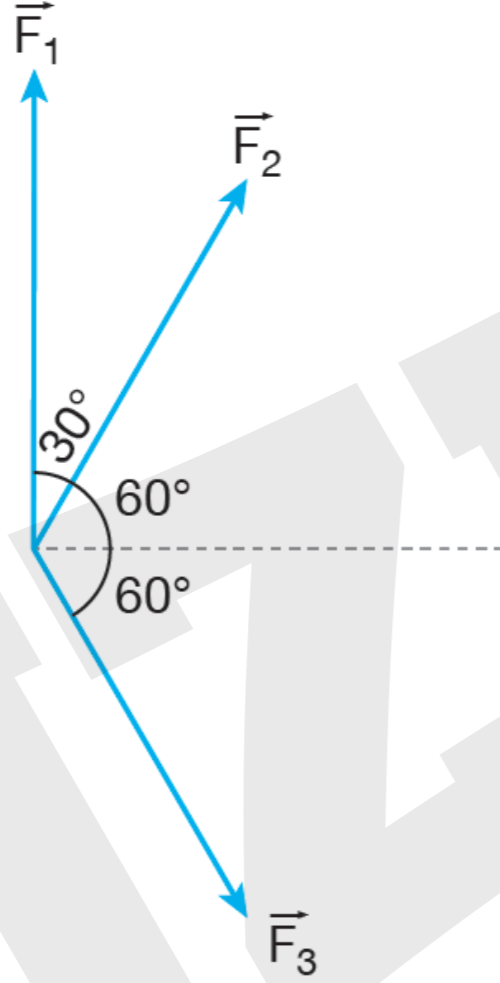
C)  $R_2 > R_1 > R_3$

D)  $R_3 > R_2 > R_1$

E)  $R_3 > R_1 > R_2$

## Örnek:

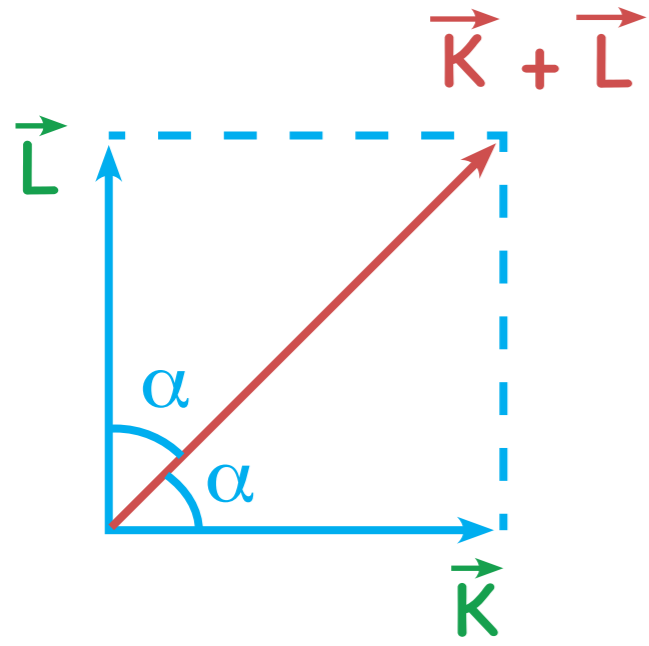
Aynı düzlemdeki  $\vec{F}_1$ ,  $\vec{F}_2$ ,  $\vec{F}_3$  kuvvetleri şekildeki gibidir.



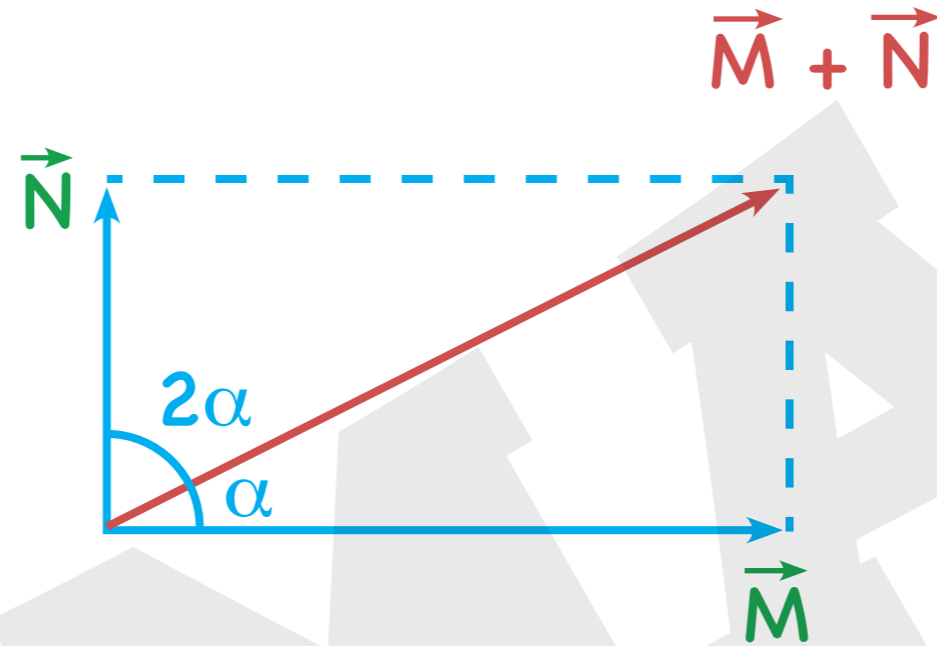
Kuvvetlerin büyüklükleri eşit ve  $F$  olduğuna göre  $\vec{F}_1$ ,  $\vec{F}_2$ ,  $\vec{F}_3$  kuvvetlerinin bileşkesinin büyüklüğü kaç  $F$ 'dir?

- A) 3      B)  $2\sqrt{2}$       C) 2      D)  $\sqrt{2}$       E) 1

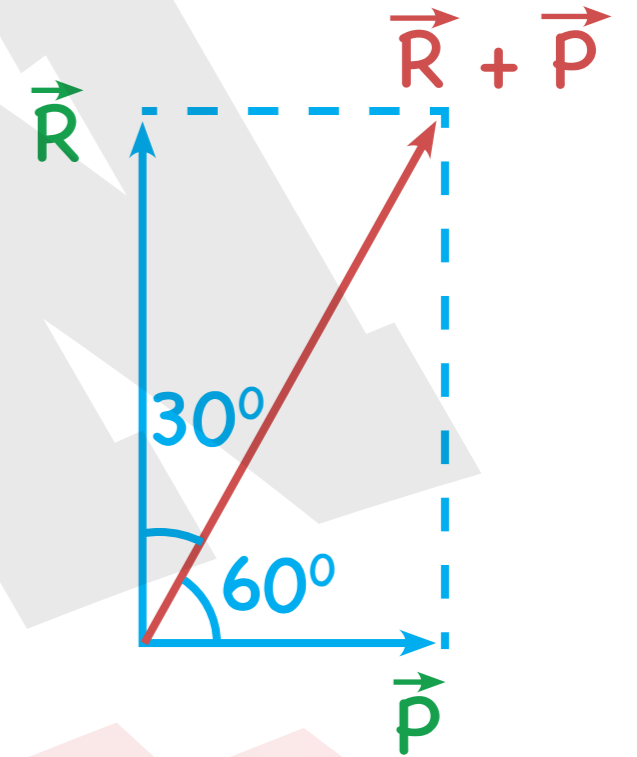
## 4. Bileşke büyük bileşene yakındır.



$K=L$



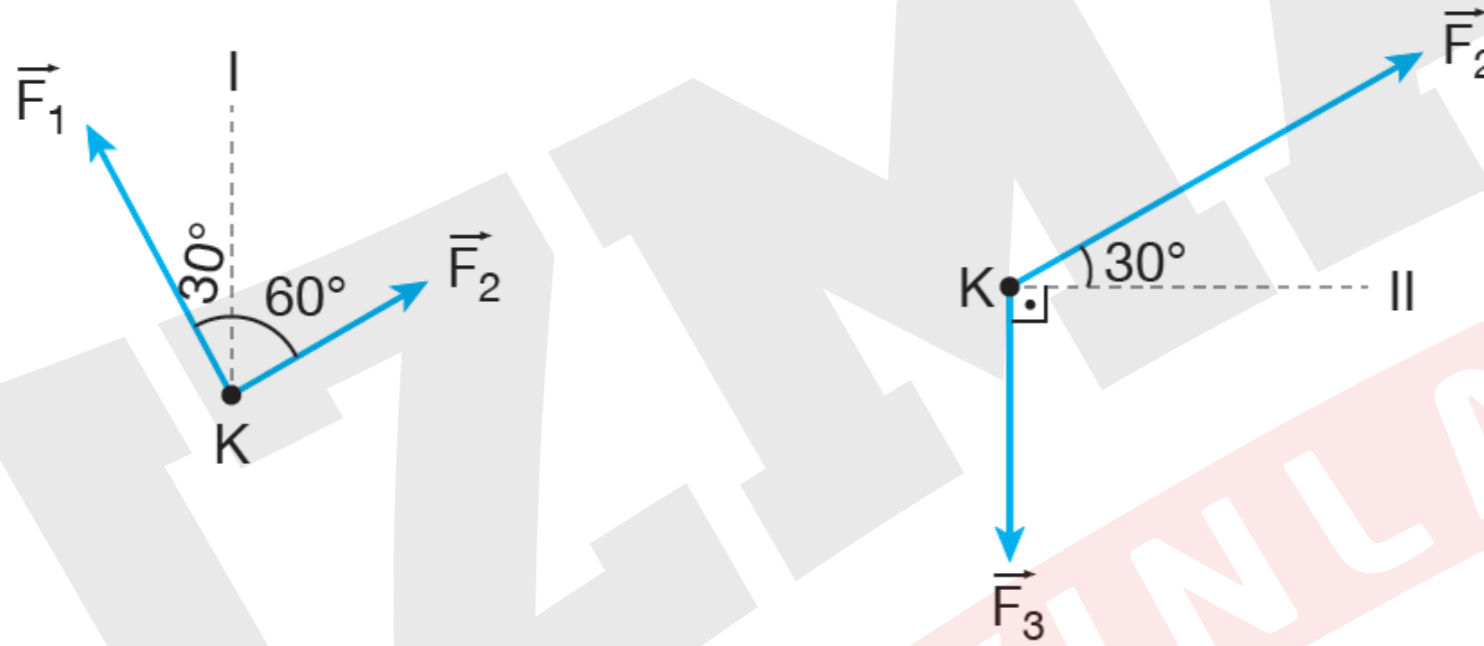
$M>N$



$R>P$

## Örnek:

Şekildeki  $\vec{F}_1$ ,  $\vec{F}_2$ ,  $\vec{F}_3$  kuvvetleri sayfa düzleminindedir. Noktasal K cismi  $\vec{F}_1$  ve  $\vec{F}_2$  kuvvetlerinin etkisinde iken I doğrultusunda,  $\vec{F}_2$  ve  $\vec{F}_3$  kuvvetlerinin etkisinde iken II doğrultusunda harekete başlıyor.



Buna göre  $\vec{F}_1$ ,  $\vec{F}_2$  ve  $\vec{F}_3$  kuvvetlerinin büyüklükleri arasındaki ilişki nedir?

A)  $F_1 = F_2 = F_3$

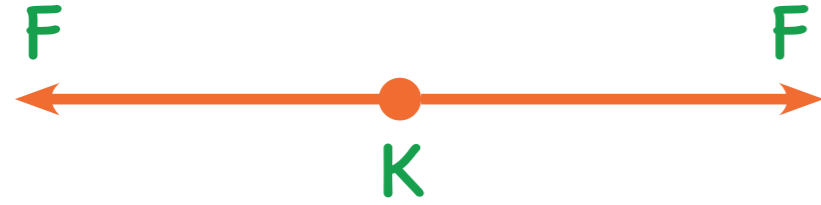
B)  $F_1 > F_2 > F_3$

C)  $F_1 > F_3 > F_2$

D)  $F_2 > F_1 > F_3$

E)  $F_3 > F_2 > F_1$

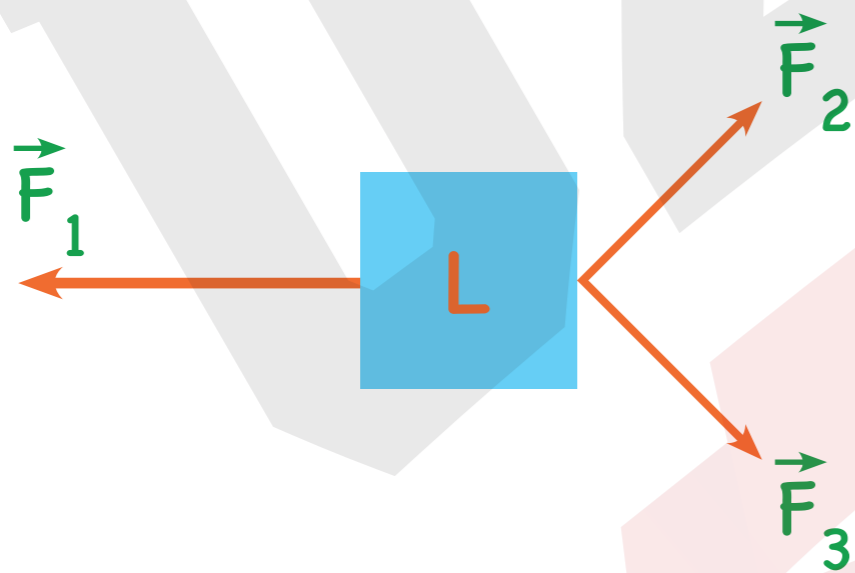
# Noktasal Cisimlerin Dengesi



$\vec{R} = 0 \rightarrow$  Cisim dengededir.

Cisim durmakta

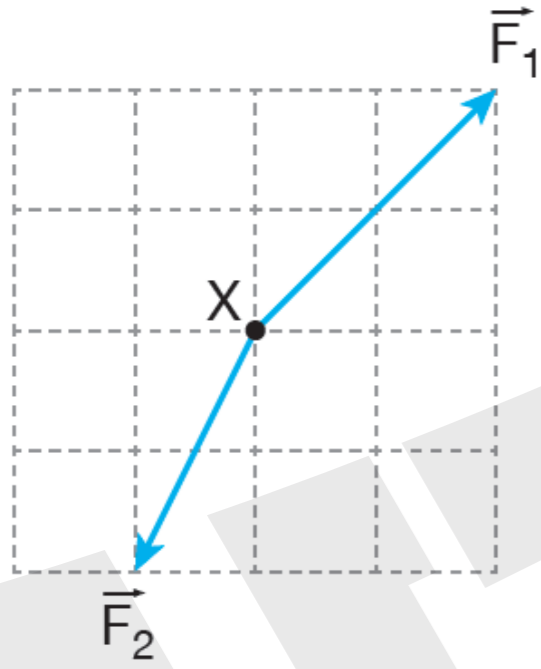
Cisim sabit hızlı



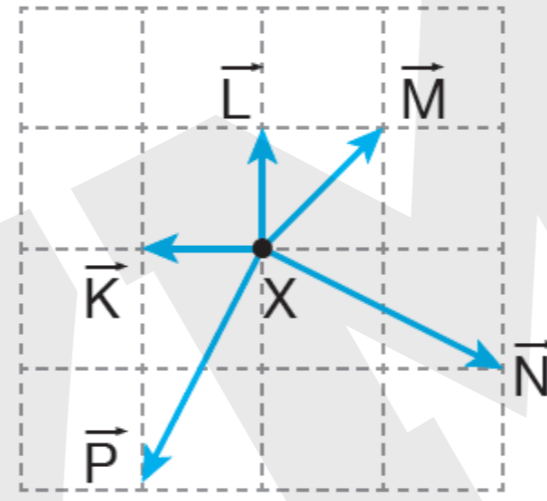
$\vec{F}_1 + \vec{F}_2 + \vec{F}_3 = 0 \rightarrow$  L dengede

## Örnek:

Sürtünmesiz yatay düzlemdeki noktasal X parçacığı aynı düzlemdeki üç ayrı kuvvetin etkisinde hareketsiz kalıyor.



Şekil I

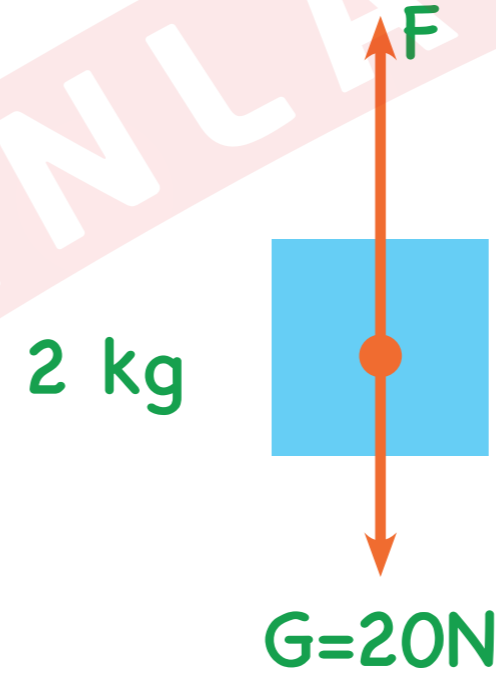
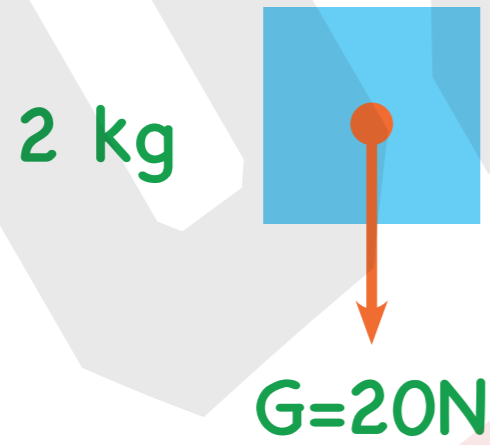


Şekil II

Bu kuvvetlerden ikisi  $\vec{F}_1$  ve  $\vec{F}_2$  Şekil I'deki gibi olduğuna göre, üçüncü kuvvet Şekil II'de verilenlerden hangisidir?  
(Bölmeler eşit aralıktır.)

- A)  $\vec{K}$       B)  $\vec{L}$       C)  $\vec{M}$       D)  $\vec{N}$       E)  $\vec{P}$

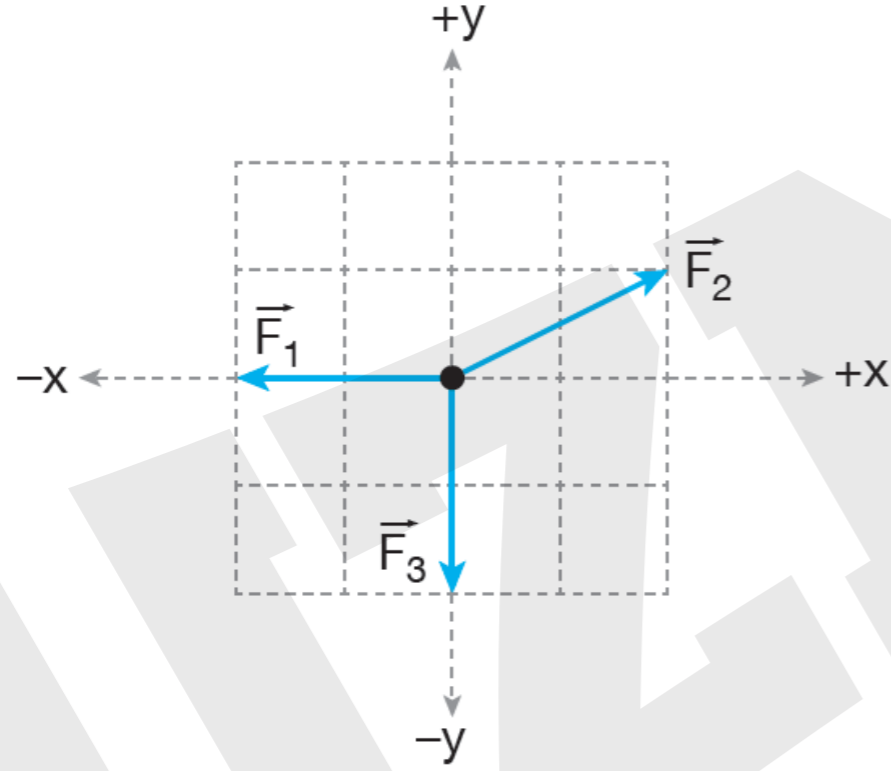
$\vec{R} \neq 0 \rightarrow$  Duran cisim R yönünde hareket eder.





## Örnek:

Sürtünmesiz yatay düzlemde durmakta olan noktasal bir parçacığa aynı düzlemdeki üç ayrı kuvvet şekildeki gibi uygulanıyor.



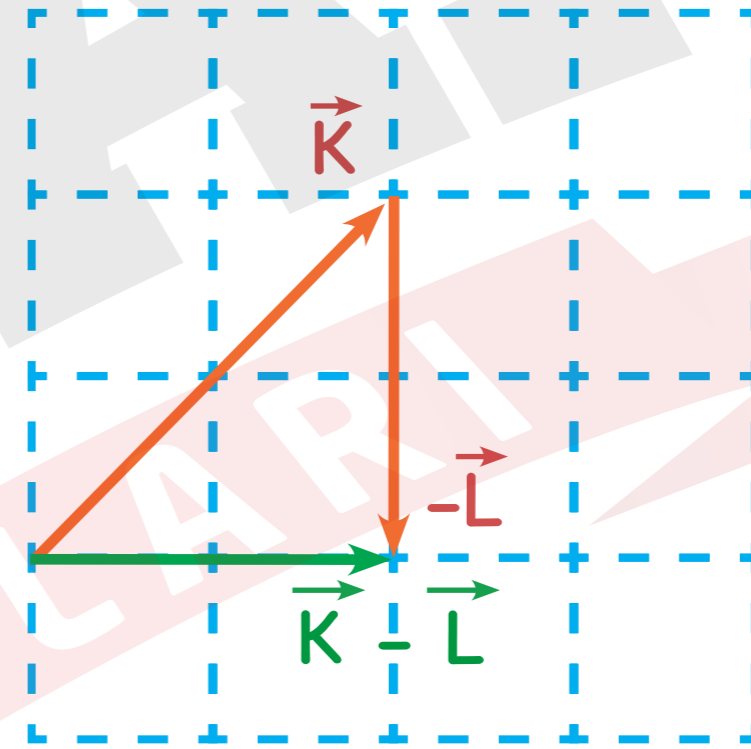
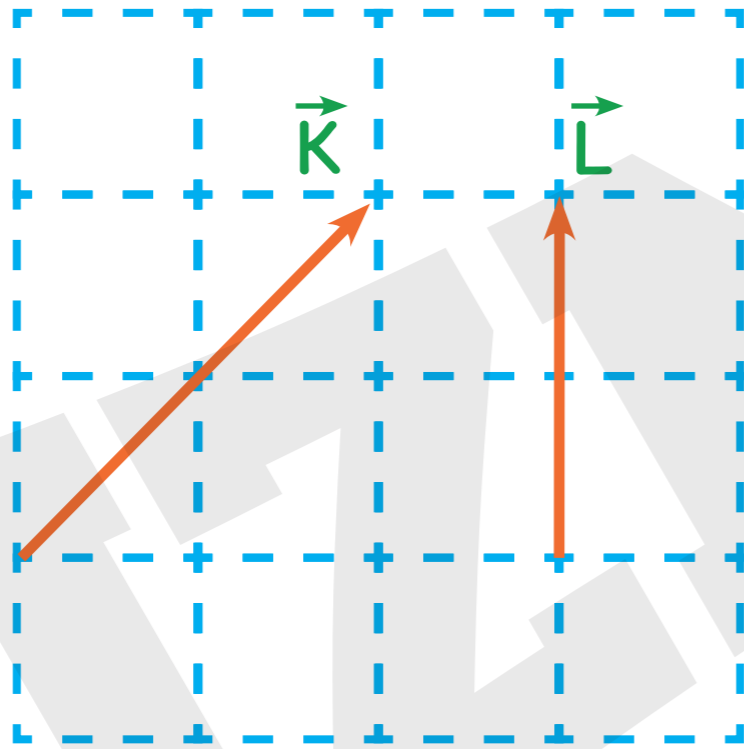
**Buna göre, parçacık hangi yönde hareket eder?**

(Bölmeler eşit aralıktır.)

- A)  $\vec{F}_1$  yönünde      B)  $+y$  yönünde      C)  $\vec{F}_2$  yönünde  
D)  $+x$  yönünde      E)  $\vec{F}_3$  yönünde

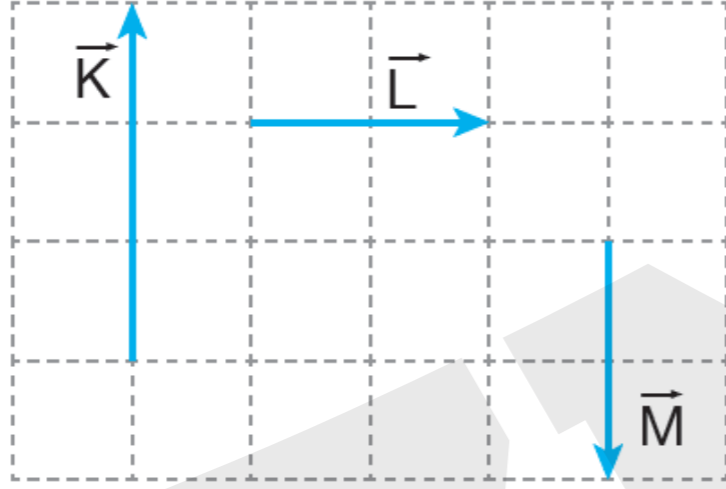
# Vektörlerde Çıkarma İşlemi

$$\vec{K} - \vec{L} = \vec{K} + (-\vec{L})$$



## Örnek:

Eşit karelere ayrılmış düzlemdeki  $\vec{K}$ ,  $\vec{L}$  ve  $\vec{M}$  vektörleri şekildeki gibidir.



Buna göre,  $\vec{K} - \vec{L} + \vec{M}$  vektörü aşağıdakilerden hangisidir?

