

# YAKEEN NEET 2.0

**2026**

**Vectors**

**PHYSICS**

**Lecture – 7**

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## Today's Goal

- Component of vector & ques practise.



which of the following vector are unit vector.

~~①~~  $\vec{A} = 3\hat{i} + 4\hat{j}$   
 $A = \sqrt{3^2 + 4^2} = 5 \neq 1$

~~②~~  $\vec{A} = \hat{i} + \hat{j}$   
 $A = \sqrt{2}$

~~③~~  $\vec{A} = \hat{i} - \hat{j} + \hat{k}$   
 $A = \sqrt{3}$

✓ ~~④~~  $\vec{A} = \frac{\hat{i} + \hat{j}}{\sqrt{2}}$   
 $A = \sqrt{\left(\frac{1}{\sqrt{2}}\right)^2 + \left(\frac{1}{\sqrt{2}}\right)^2} = 1$

⑤  $\vec{A} = \frac{\hat{i} + \hat{j} + \hat{k}}{\sqrt{3}}$

⑥  $\vec{A} = \frac{\hat{i} - \hat{j} - \hat{k}}{\sqrt{3}}$

⑦  $\vec{A} = \sin\theta \hat{i} + \cos\theta \hat{j}$

⑧  $\vec{A} = \sin\theta \hat{i} - \cos\theta \hat{j}$

⑨  $\vec{A} = \frac{\vec{p} + \vec{q}}{|\vec{p} + \vec{q}|}$

⑩  $\vec{A} = \frac{\vec{p} + \vec{q} - \vec{r}}{|\vec{p} + \vec{q} - \vec{r}|}$

⑪  $\vec{A} = \frac{\vec{p} + \vec{q} - \vec{r}}{|\vec{p} + \vec{q} + \vec{r}|}$



which of the following vector are unit vector.



⑤  $\vec{A} = \frac{\hat{i} + \hat{j} + \hat{k}}{\sqrt{3}} \Rightarrow A = \sqrt{\left(\frac{1}{\sqrt{3}}\right)^2 + \left(\frac{1}{\sqrt{3}}\right)^2 + \left(\frac{1}{\sqrt{3}}\right)^2} = 1$

⑥  $\vec{A} = \frac{\hat{i} - \hat{j} - \hat{k}}{\sqrt{3}}$

⑦  $\vec{A} = \sin\theta \hat{i} + \cos\theta \hat{j} \quad A = \sqrt{(\sin\theta)^2 + (\cos\theta)^2} = 1$

⑧  $\vec{A} = \sin\theta \hat{i} - \cos\theta \hat{j}$

⑨  $\vec{A} = \frac{\vec{P} + \vec{Q}}{|\vec{P} + \vec{Q}|} = \frac{\vec{R}}{|\vec{R}|}$

⑩  $\vec{A} = \frac{\vec{P} + \vec{Q} - \vec{R}}{|\vec{P} + \vec{Q} - \vec{R}|}$

⑪  $\vec{A} = \frac{\vec{P} + \vec{Q} + \vec{R}}{|\vec{P} + \vec{Q} + \vec{R}|}$

which of the following vector are unit vector.

$$\textcircled{10} \vec{A} = \frac{\vec{P} + \vec{Q} - \vec{R}}{|\vec{P} + \vec{Q} - \vec{R}|} = \frac{\overline{chgs}}{|\overline{chgs}|} = \checkmark$$

$$\times \textcircled{11} \vec{A} = \frac{\vec{P} + \vec{Q} - \vec{R}}{|\vec{P} + \vec{Q} + \vec{R}|}$$

$$\vec{P} + \vec{Q} - \vec{R} = \vec{s}$$



Q. which of the follow vectors can give Resultant 10 unit.

①  $A = 15$   
 $B = 6$

$$15 - 6 \leq R \leq 15 + 6$$

$$9 \leq R \leq 21$$

~~②~~  $A = 12$   
 $B = 1$

$$11 \leq R \leq 13$$

③  $A = 16$   
 $B = 6$

$$10 \leq R \leq 22$$

Q which of following set of magnitude of three vector can give zero resultant



①  $4N, 3N, 6N$   
min =  $1N$  max =  $7N$

③  $6N, 10N, 15N$

~~⑧  $5N, 3N, 12N$~~

④  $1N, 2N, 1N$

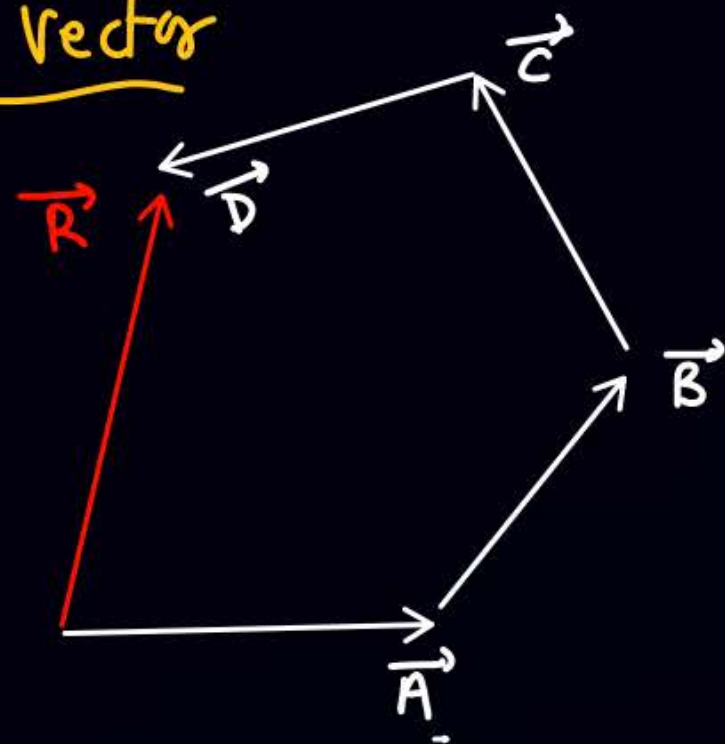
~~②  $5N, 6N, 15N$   
min  $1N$  max  $11N$~~

⑤  $3N, 4N, 6N$

⑥  $10N, 10N, 10N$

~~⑦  $2N, 10N, 3N$~~

## Component of a vector

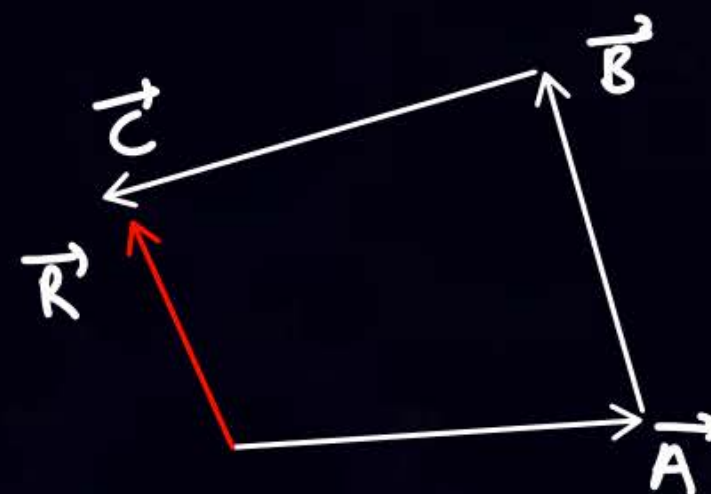


$$\vec{A} + \vec{B} + \vec{C} + \vec{D} = \vec{R}$$

$$\vec{R} = \vec{A} + \vec{B} + \vec{C} + \vec{D}$$

hence  $\vec{A}, \vec{B}, \vec{C}, \vec{D}$  are four components of  $\vec{R}$ .

(SKC)  $\Rightarrow$



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

hence  $\vec{A}, \vec{B}, \vec{C}$  are three components of  $\vec{R}$ .



# Rectangular component of a Vector

$$\vec{A}_x + \vec{A}_y = \vec{A}$$

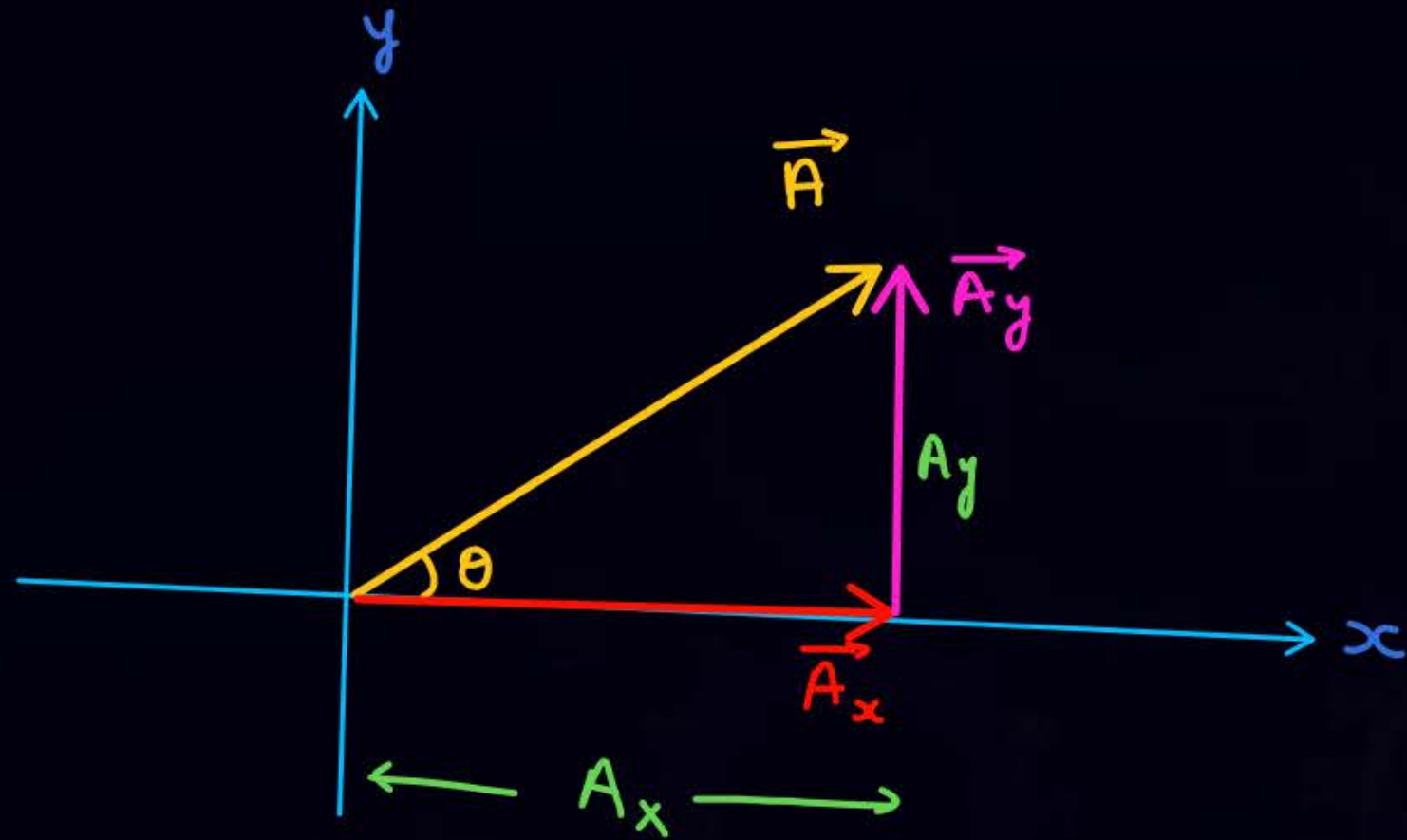
$$\vec{A} = \vec{A}_x + \vec{A}_y$$

$\vec{A}_x \rightarrow$  Component of  $\vec{A}$  along x-Axis

$\vec{A}_y \rightarrow$  " " " y-Axis

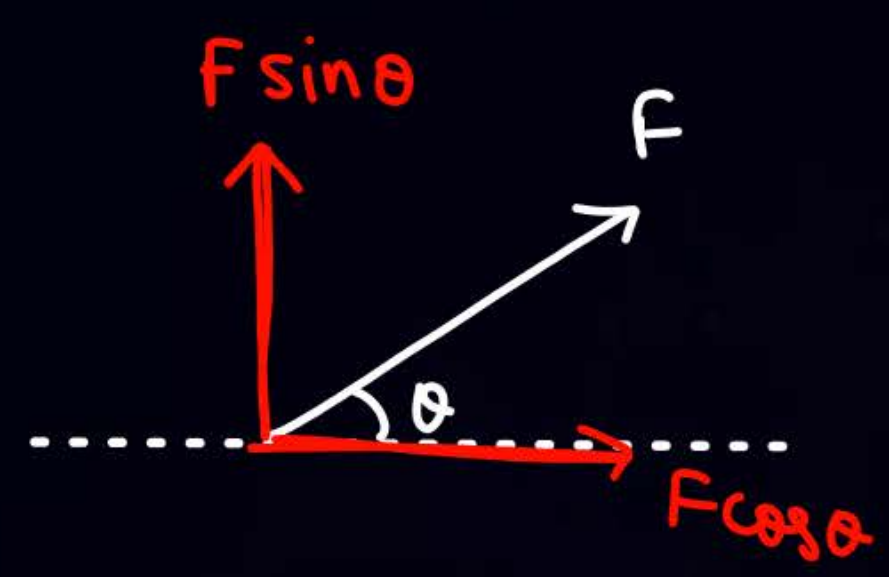
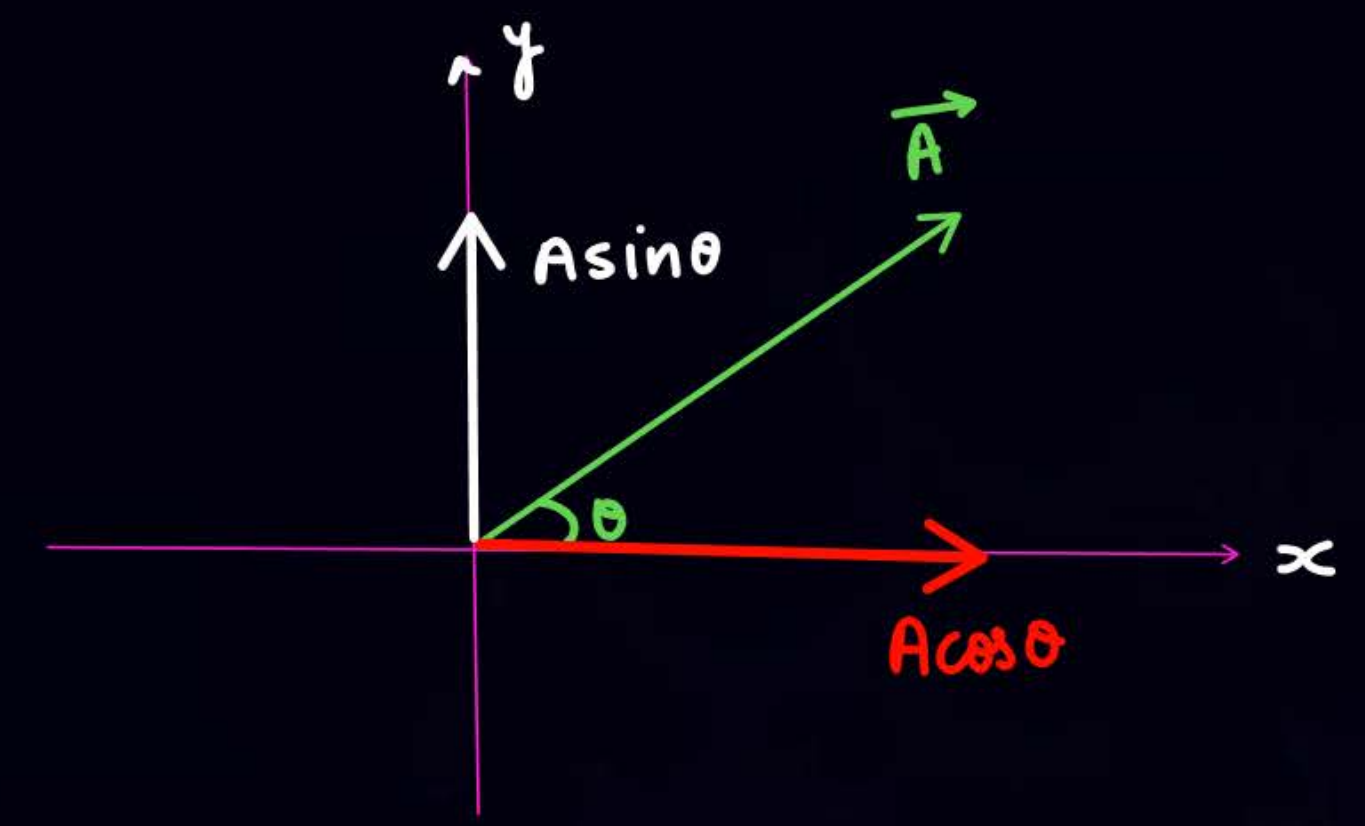
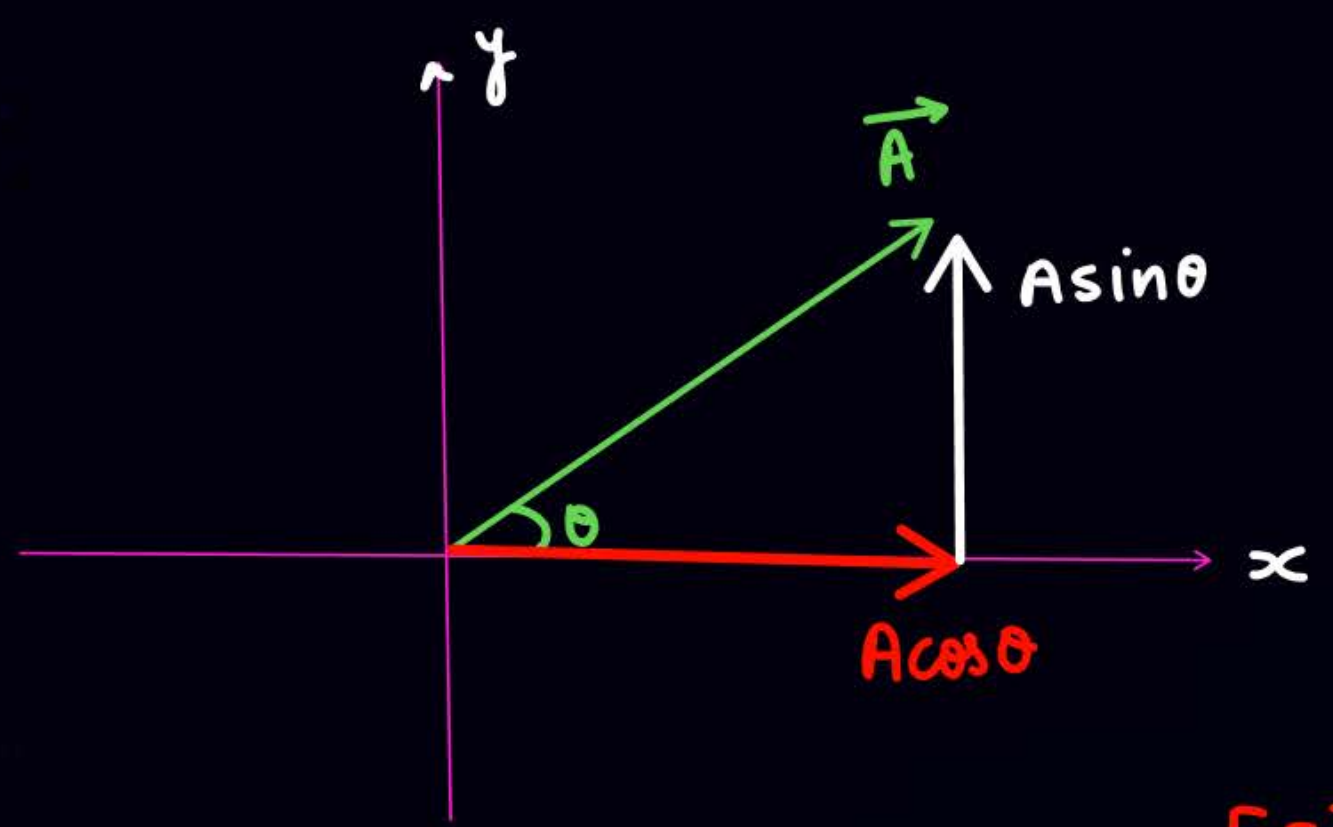
$$\vec{A} = \vec{A}_x + \vec{A}_y$$

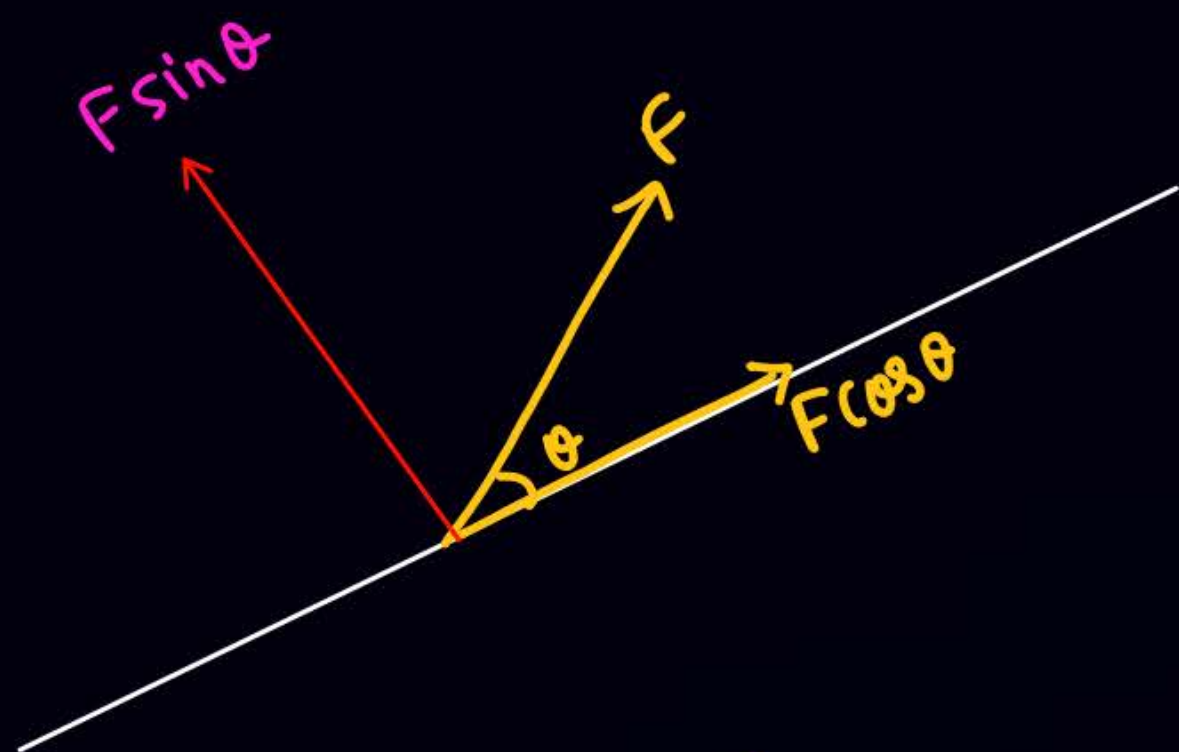
$$\vec{A} = (A \cos \theta) \hat{i} + (A \sin \theta) \hat{j}$$



$$\cos \theta = \frac{A_x}{A} \Rightarrow \boxed{A_x = A \cos \theta}$$

$$\sin \theta = \frac{A_y}{A} \Rightarrow \boxed{A_y = A \sin \theta}$$

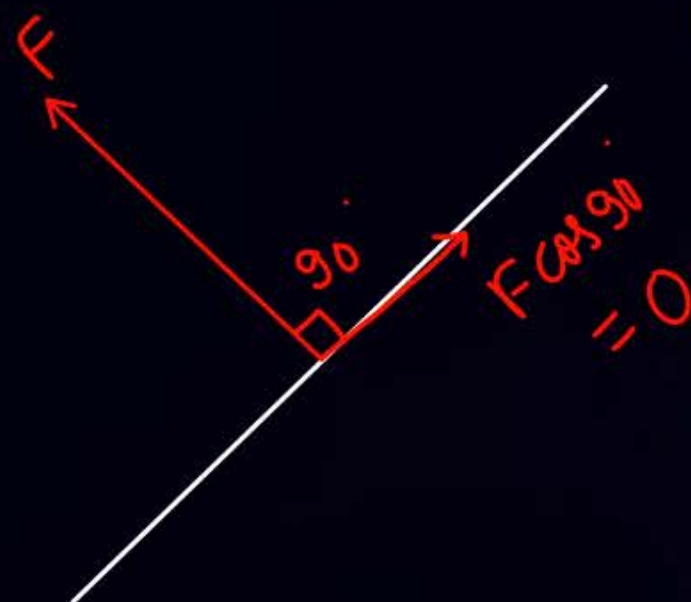




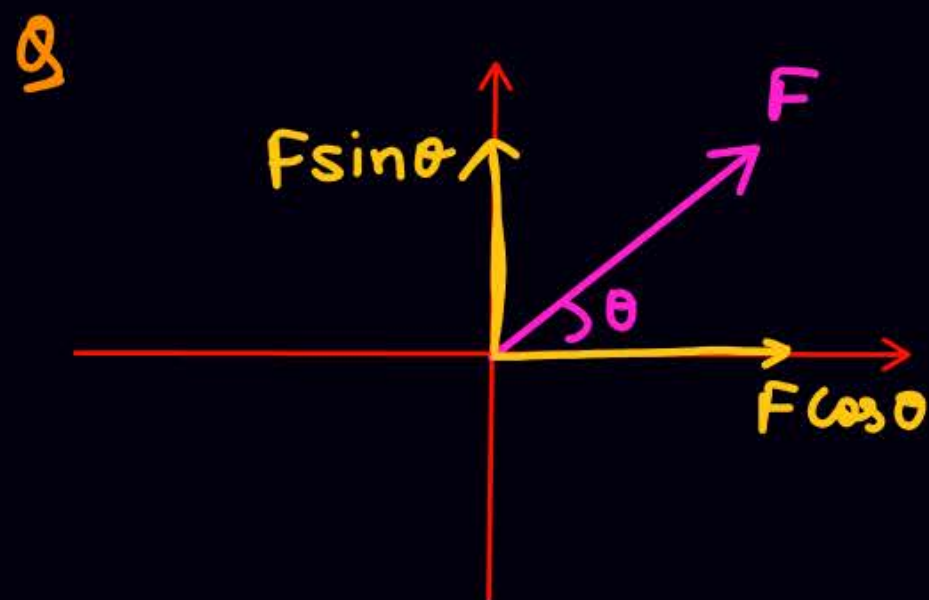
(SKC)

जिस line के साथ angle  $\theta$  बनाया  
उधर  $F \cos \theta$  आया  
और  $F \sin \theta$  ऐसे लगाना है ताकि  
 $F \cos \theta$  &  $F \sin \theta$  के बीच  $F$  रहे

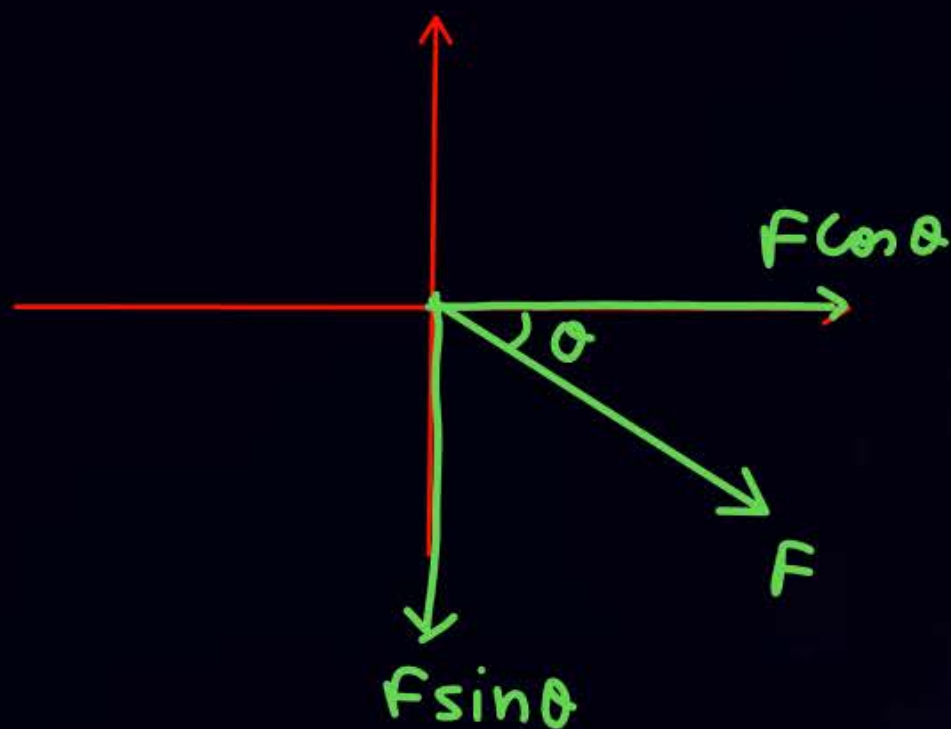
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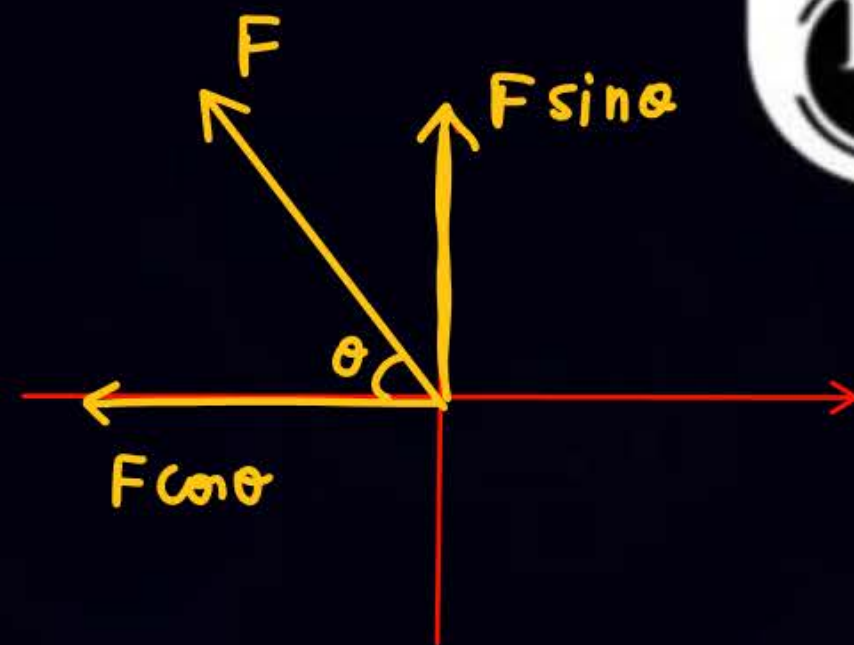




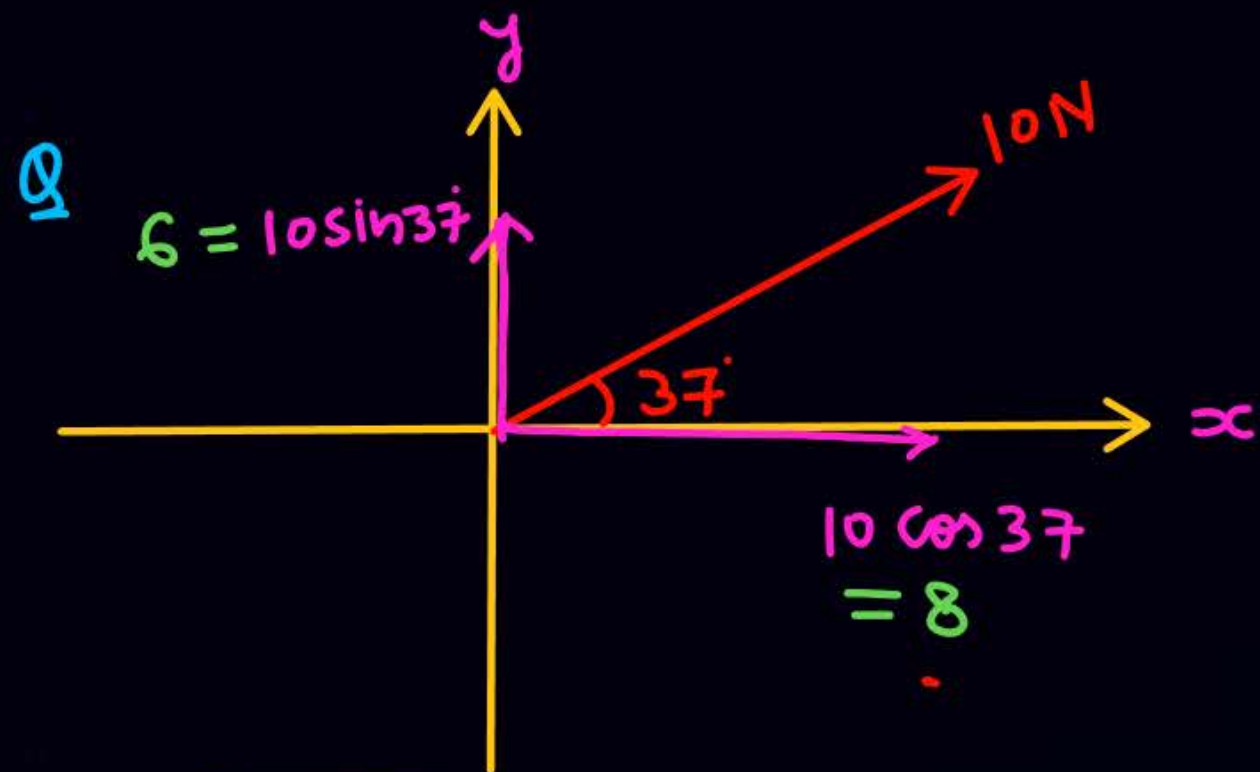
$$\vec{F} = F \cos \theta \hat{i} + F \sin \theta \hat{j}$$



$$\vec{F} = F \cos \theta \hat{i} - F \sin \theta \hat{j}$$



$$\vec{F} = -F \cos \theta \hat{i} + F \sin \theta \hat{j}$$



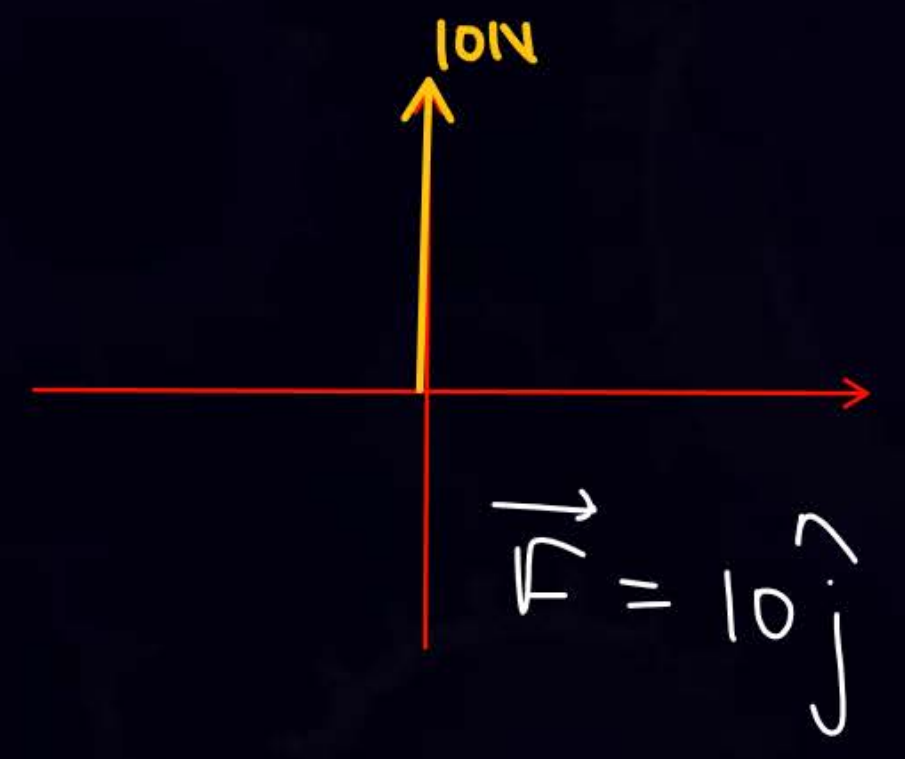
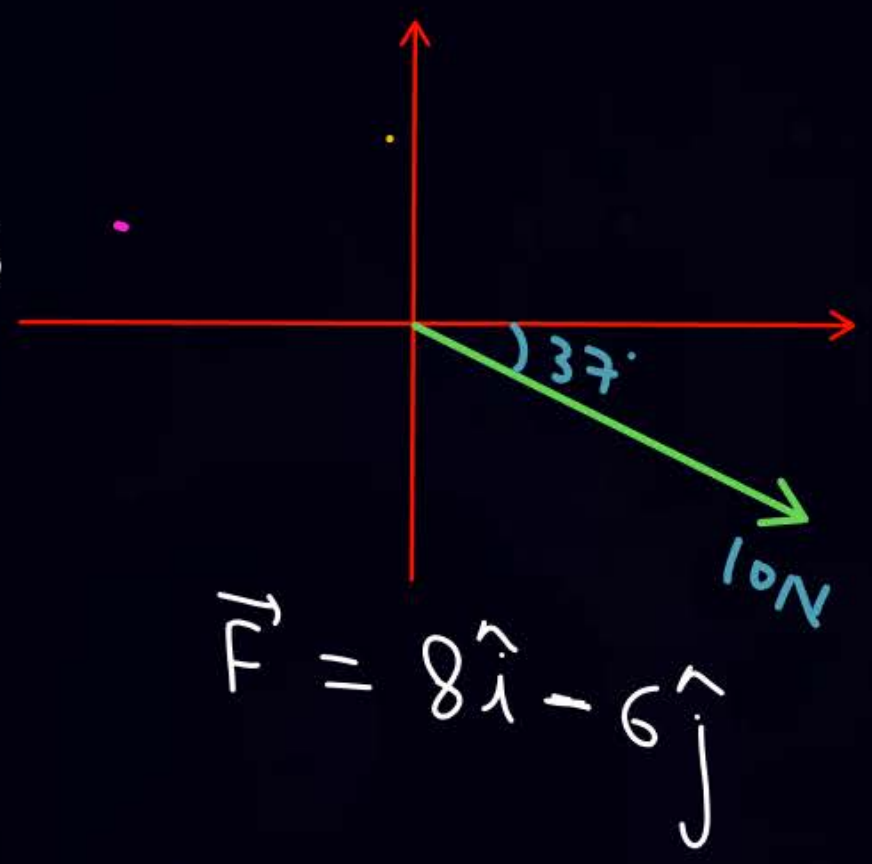
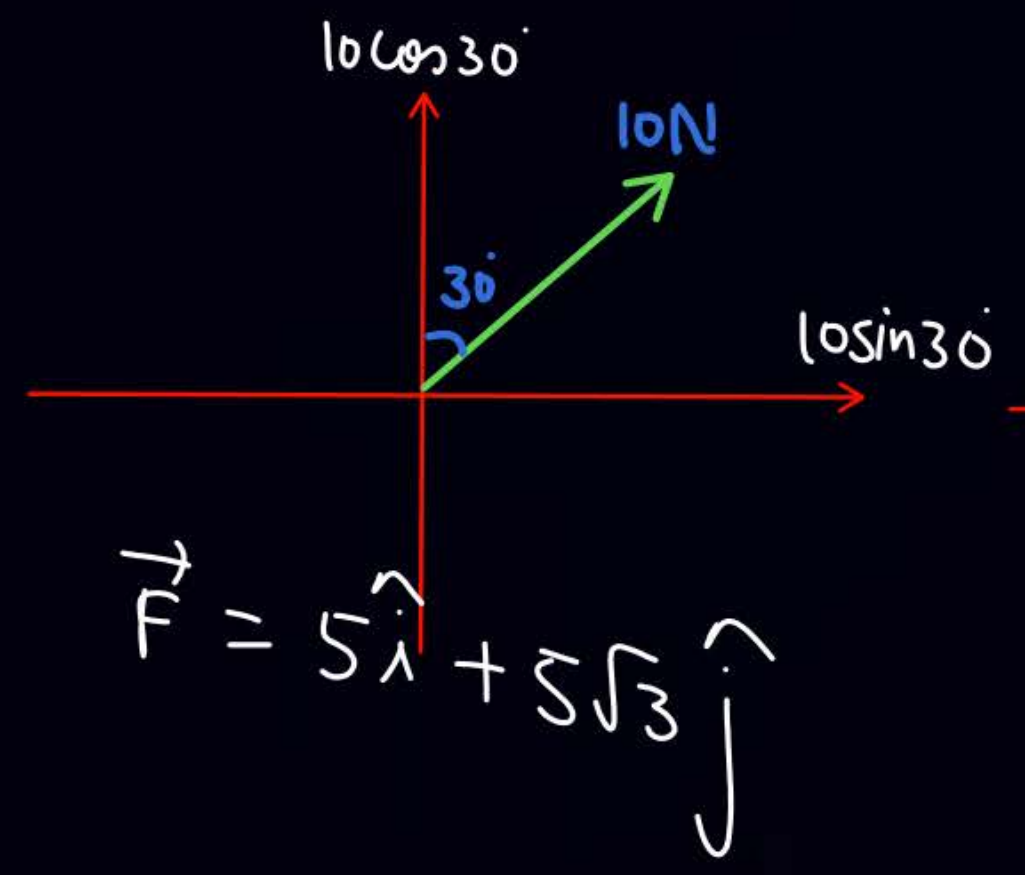
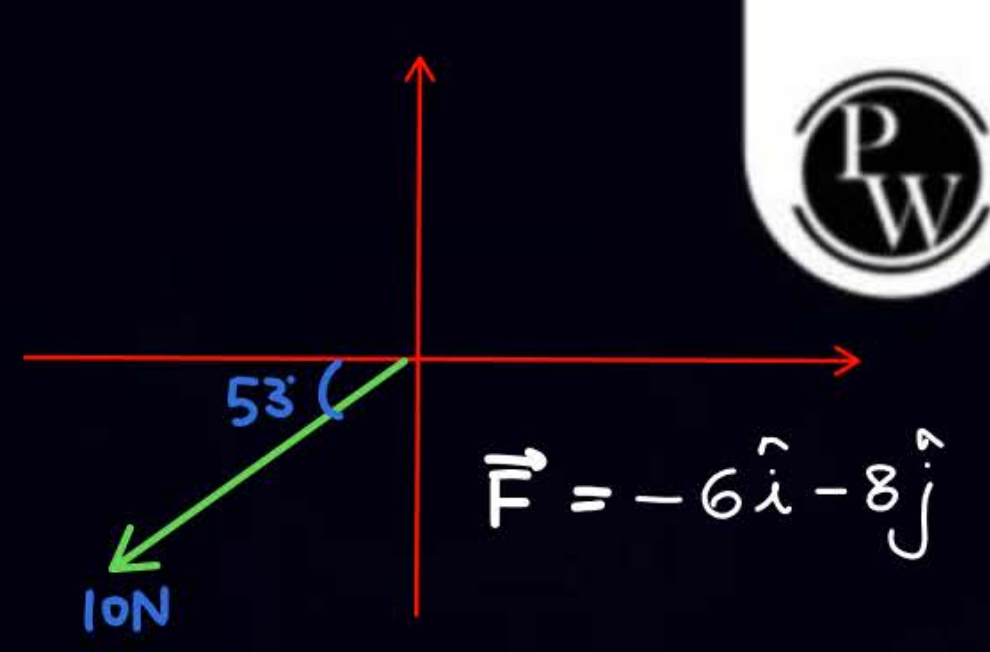
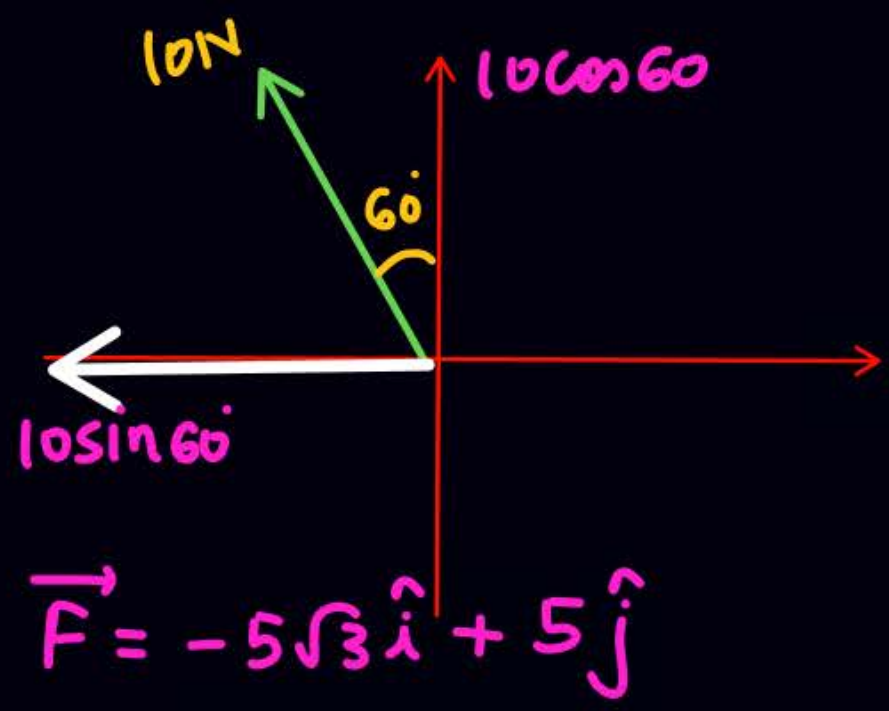
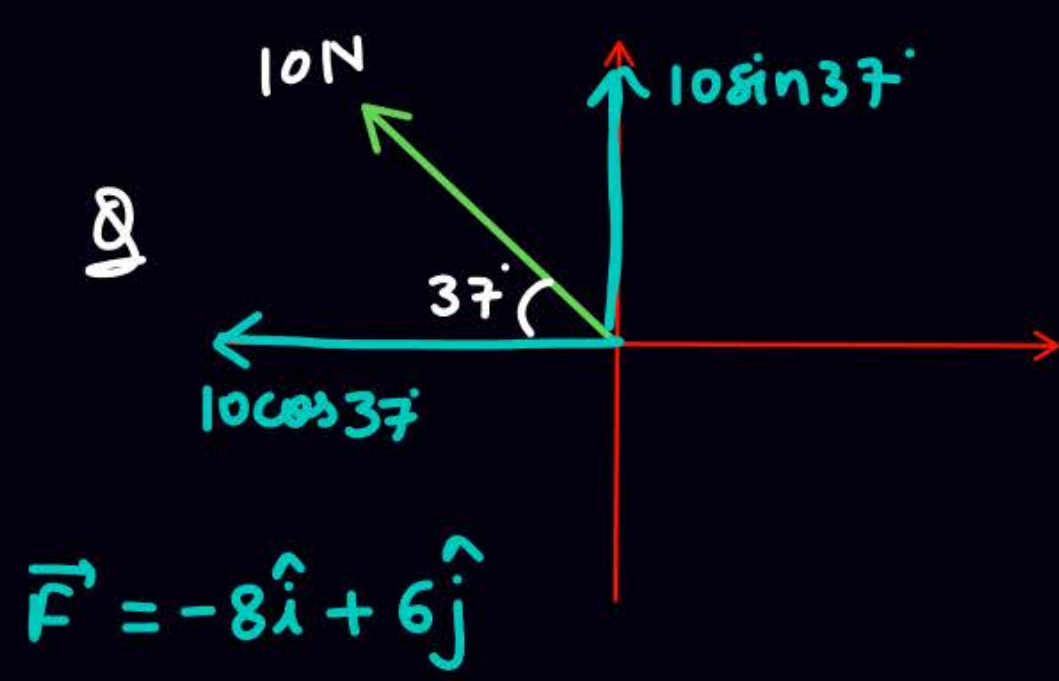
$$\vec{F} = 8\hat{i} + 6\hat{j}$$

$$\cos 37 = \frac{4}{5}$$

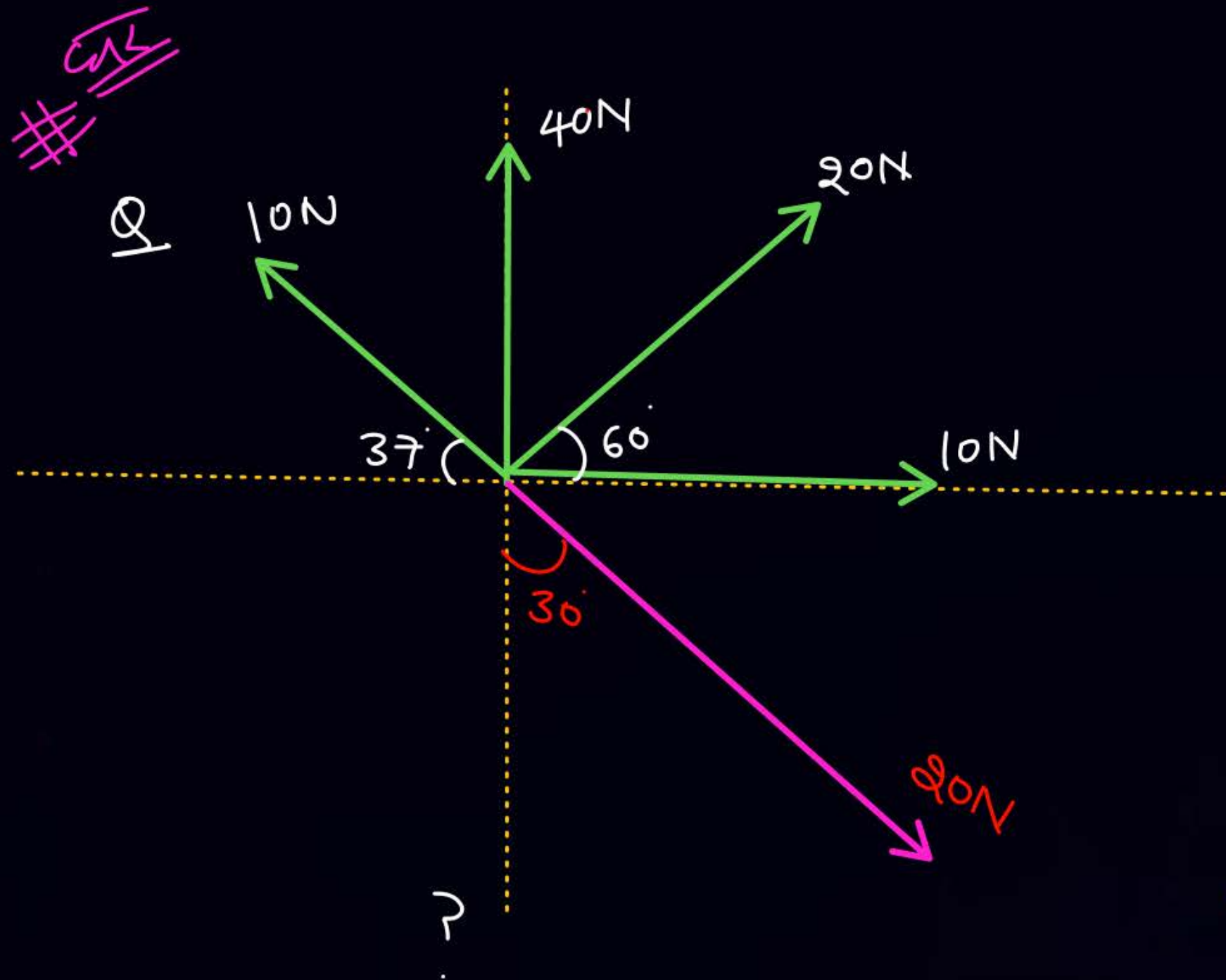
$$\sin 37 = \frac{3}{5}$$

$$10 \cos 37 = 10 \times \frac{4}{5} = 8$$

$$10 \sin 37 = 10 \times \frac{3}{5} = 6$$

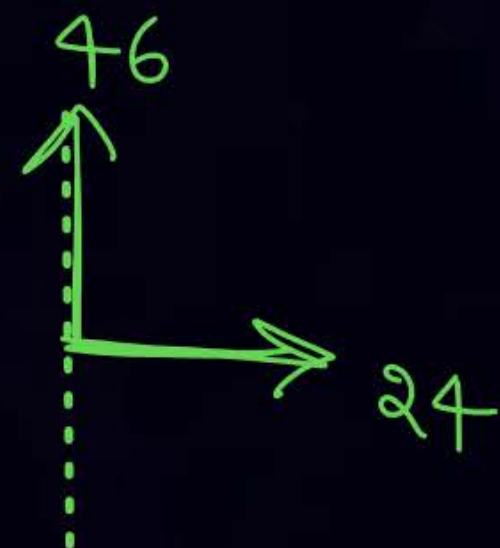






$\Rightarrow$

$$6 = 10 \cos 37$$



$$20 \sin 60 + 40$$

$$10 \sin 37$$

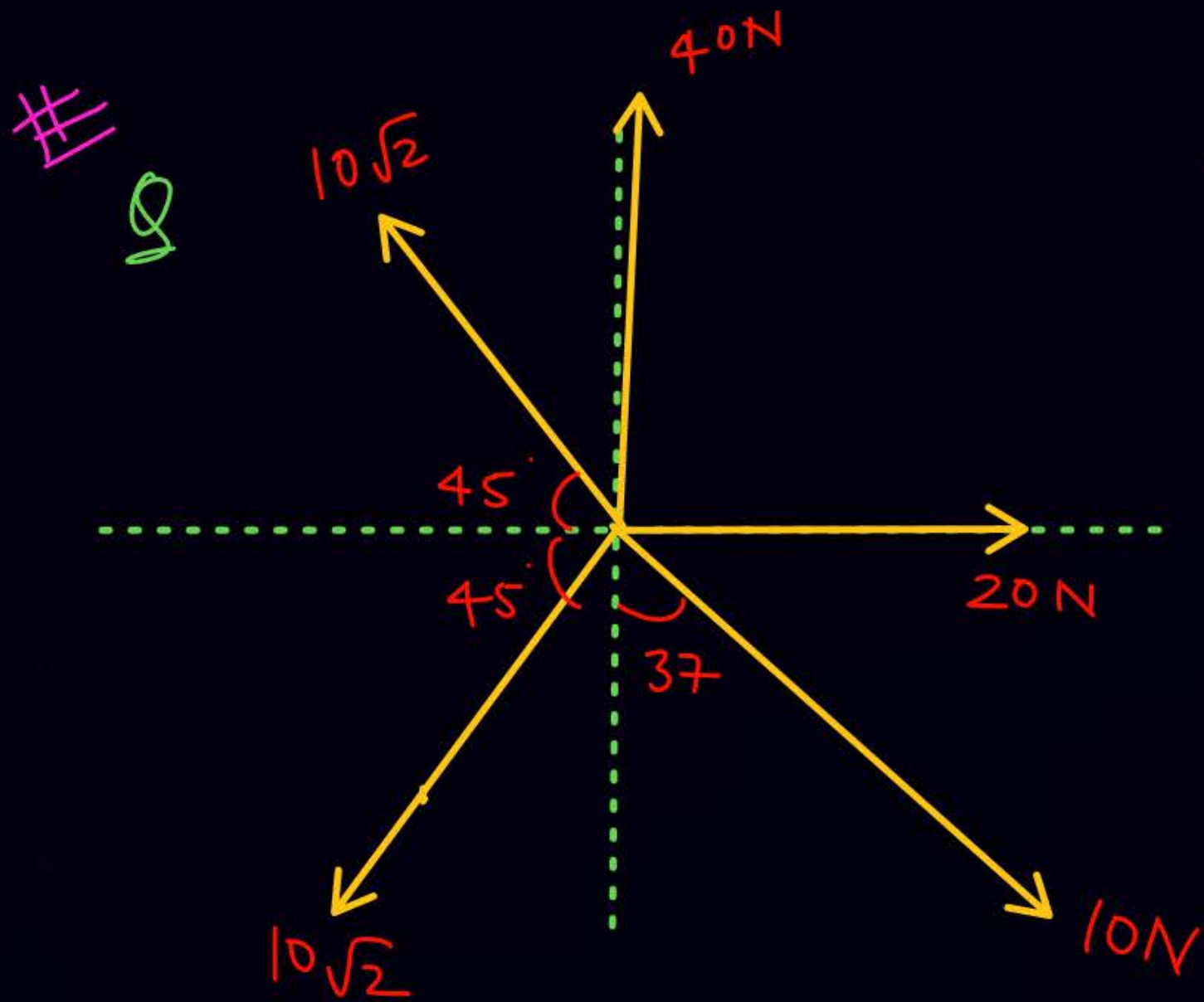
$$10 + 20 \cos 60$$

$$+ 20 \sin 30$$

$$= 30$$

$$20 \cos 30 = 10\sqrt{3}$$

$$\vec{F}_{\text{net}} = 24\hat{i} + 46\hat{j}$$



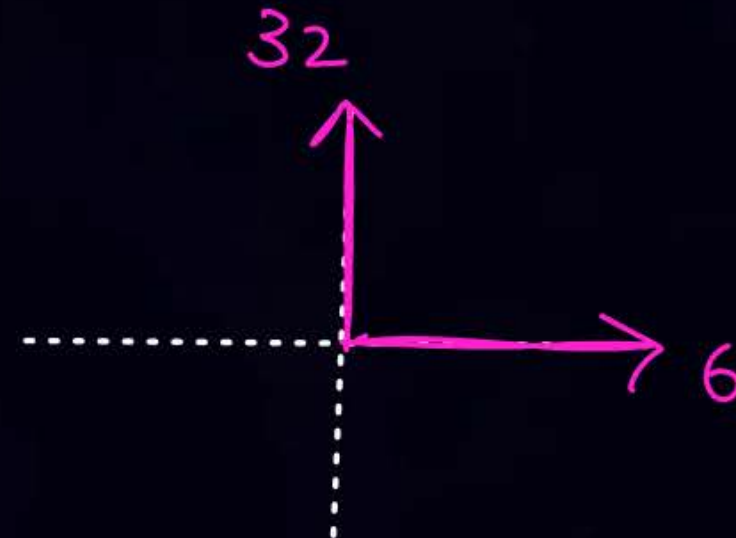
#1

$$10\sqrt{2} \cos 45^\circ + 10\sqrt{2} \cos 45^\circ = 20$$

$$40 + 10\sqrt{2} \sin 45^\circ = 50$$

$$20 + 10 \sin 37^\circ = 26$$

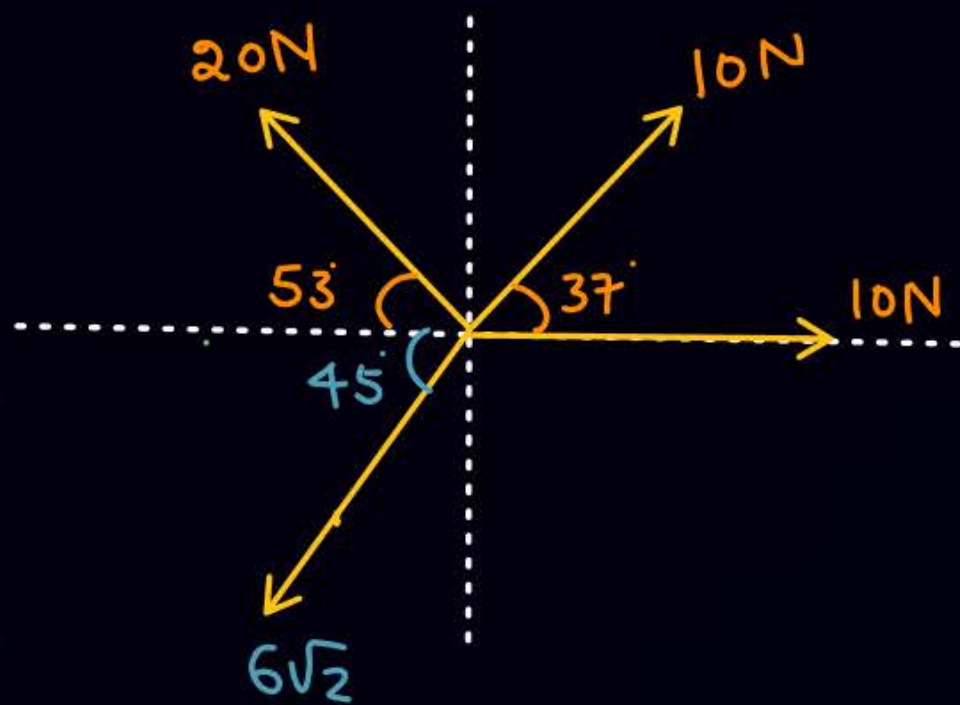
$$10 \cos 37^\circ + 10\sqrt{2} \sin 45^\circ = 18$$



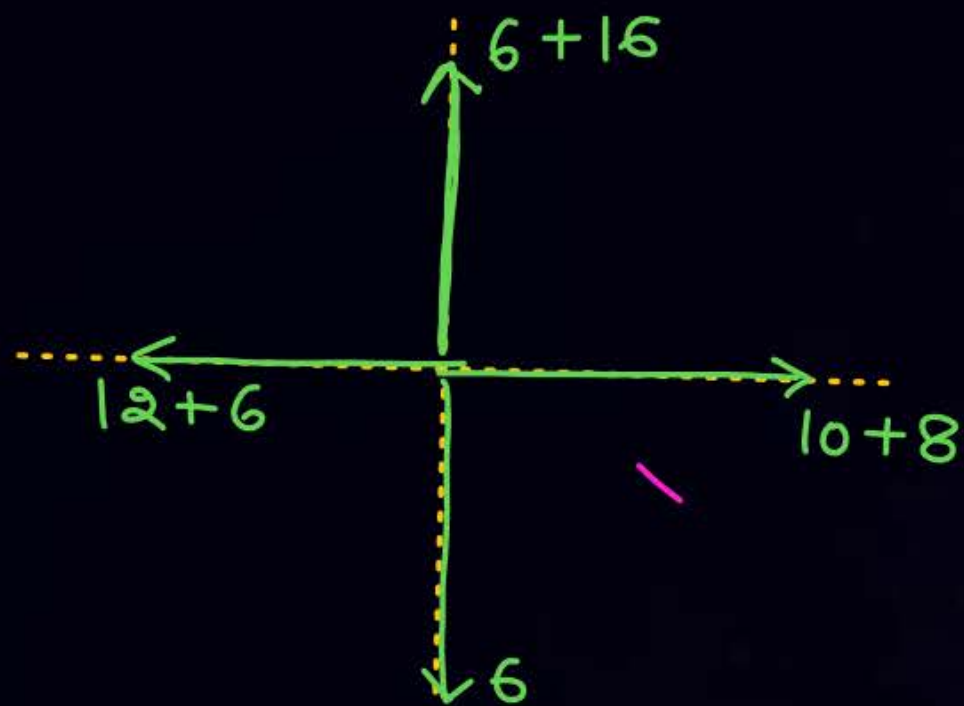
$$\vec{F}_{\text{net}} = 6\hat{i} + 32\hat{j}$$



Q ①  $F_{net}$



$$F_{net} = 16\hat{j}$$



⑥ what external force must be added in a point so that particle remains in equilibrium

Ans  $-16\hat{j}$





ମିଥେନ



സലീം അഫ് ഫദ്  
ശക്തി

അയ്യപ്പി  
കിനയ്യത്  
കിനയ്യദ്

SKC

Starting ke do vector ke magnitude se unki max  $(A+B)$   
& min  $|A-B|$  value nikalo aur Dekho ki third vector  
in dono value ke beech me aa raha hai ya nahi

Agar aya to resultant zero possible hai.

$$(F_1, F_2, F_3) \equiv |F_1 - F_2| \leq F_3 \leq (F_1 + F_2)$$





## Home work

- DPP
- KPP-09 (if you have not solved)  
↓  
try ques 2, 8 (atleast)
- Module  
Prabal (ex. 119) (1-8)  
Aarambh = 1, 2, 4,

module  
ques  
will upload  
here



Thank  
You