YAKEEN NEET 2.0

2026

KPP (Discussion)

Vectors

PHYSICS | Lecture - (PYQ)

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KPP Vector PYQ Discussion

QUESTION - 01

If $\vec{A} = (2\hat{i} + 3\hat{j} - \hat{k})$m and $\vec{B} = (\hat{i} + 3\hat{j} + 2\hat{k})$m. The magnitude of component of vector $\vec{A}$ along vector $\vec{B}$ will be 2 m.

[JEE Main 2022]

$$\text{Acos}\theta \Rightarrow \frac{\vec{A}\cdot\vec{B}}{B} = \frac{2+9-2}{\sqrt{14}} = \frac{9}{\sqrt{14}} = \frac{9}{3.8} \approx 2.36$$

Ans : (2)

QUESTION - 02

If the projection of $2\hat{i} + 4\hat{j} - 2\hat{k}$ on $\hat{i} + 2\hat{j} + \alpha\hat{k}$ is zero. Then, the value of α will be.

[JEE Main 2022]

$\theta = 90^\circ \qquad \vec{A} \perp \vec{B} \qquad \vec{A} \cdot \vec{B} = 0$

$2 + 8 - 2\alpha = 0$

$\alpha = 5$

Ans : (5)

QUESTION - 03

Which of the following relation is true for two unit vectors $\hat{A}$ and $\hat{B}$ making an angle θ to each other?

[JEE Main 2022]

(1) $|\hat{A}+\hat{B}|=|\hat{A}-\hat{B}|\tan\frac{\theta}{2}$

(2) $|\hat{A}-\hat{B}|=|\hat{A}+\hat{B}|\tan\frac{\theta}{2}$

(3) $|\hat{A}+\hat{B}|=|\hat{A}-\hat{B}|\cos\frac{\theta}{2}$

(4) $|\hat{A}-\hat{B}|=|\hat{A}+\hat{B}|\cos\frac{\theta}{2}$

$|\vec{A}| = |\vec{B}| = x$

$|\vec{A}+\vec{B}| = 2x\cos\theta/2$

$|\vec{A}-\vec{B}| = 2x\sin\theta/2$

$$\frac{|\hat{A}+\hat{B}|}{|\hat{A}-\hat{B}|} = \cot(\theta/2)$$

Ans : (2)

QUESTION - 04

Two vectors $\vec{A}$ and $\vec{B}$ have equal magnitude. If magnitude of $\vec{A}+\vec{B}$ is equal to two times the magnitude of $\vec{A}-\vec{B}$, then the angle between $\vec{A}$ and $\vec{B}$ will be:

[JEE Main 2022]

(1) $\sin^{-1}\left(\frac{3}{5}\right)$ (2) $\sin^{-1}\left(\frac{1}{3}\right)$

(3) $\cos^{-1}\left(\frac{3}{5}\right)$ (4) $\cos^{-1}\left(\frac{1}{3}\right)$

$A = B = x$

$|\vec{A}+\vec{B}| = 2|\vec{A}-\vec{B}|$

$\sqrt{A^2+B^2+2AB\cos\theta} = 2\sqrt{A^2+B^2-2AB\cos\theta}$

$x^2+x^2+2x^2\cos\theta = 4(x^2+x^2-2x^2\cos\theta)$

$2+2\cos\theta = 4(2-2\cos\theta)$

$10\cos\theta = 6$

$\cos\theta = \frac{6}{10} = \frac{3}{5}$

Ans : (3)

QUESTION - 05

Vectors $a\hat{i}+b\hat{j}+\hat{k}$ and $2\hat{i}-3\hat{j}+4\hat{k}$ are perpendicular to each other when $3a+2b=7$, the ratio of a to b is $x/2$. The value of x is _____.

[24 January 2023 - Shift 1]

$2a-3b+4=0$

$2a-3b=-4$

$6a-9b=-12$

$-6a\pm 4b=\mp 14$

$-13b=-26$

$b=2$

$a=1$

$\frac{a}{b}=\frac{1}{2}=\frac{x}{2}$

$x=1$

Ans : (1)

QUESTION - 06

$\vec{A}$ is a vector quantity such that $|\vec{A}|$ = non zero constant. Which of the following expression is true for $\vec{A}$?

[JEE Main 2022]

(1) $\vec{A} \cdot \vec{A} = 0$

(2) $\vec{A} \times \vec{A} < 0$

(3) $\vec{A} \times \vec{A} = 0$

(4) $\vec{A} \times \vec{A} > 0$

Ans : (3)

QUESTION - 07

If two vectors $\vec{P}=\hat{i}+2m\hat{j}+m\hat{k}$ and $\vec{Q}=4\hat{i}-2\hat{j}+m\hat{k}$ are perpendicular to each other. Then, the value of m will be:

[24 January 2023 - Shift 2]

(1) 1 (2) –1

(3) –3 (4) 2

$4-4m+m^2=0$

$m=2$

Ans : (4)

QUESTION - 08

If $\vec{P}=3\hat{i}+\sqrt{3}\hat{j}+2\hat{k}$. and $\vec{Q}=4\hat{i}+\sqrt{3}\hat{j}+2.5\hat{k}$ then, The unit vector in the direction of $\vec{P}\times\vec{Q}$ is $\frac{1}{x}\left(\sqrt{3}\hat{i}+\hat{j}-2\sqrt{3}\hat{k}\right)$. The value of x is:

[25 January 2023 - Shift 1]

$\vec{P}\times\vec{Q}$ = ✓ =

$x \Rightarrow \sqrt{3+1+12} = \sqrt{16} = 4$

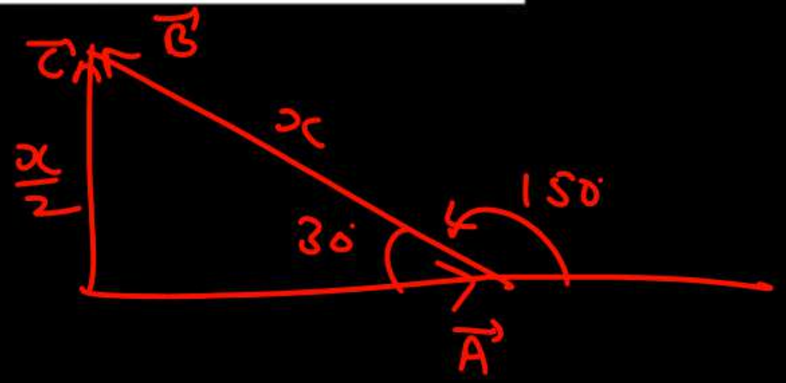
Ans : (4)

QUESTION - 09

The resultant of two vectors $\vec{A}$ and $\vec{B}$ is perpendicular to $\vec{A}$ and its magnitude is half that of $\vec{B}$. The angle between vectors $\vec{A}$ and $\vec{B}$ is _____°.

[09 April 2024 - Shift 2]

Class



Ans : (150)

QUESTION - 10

What will be the projection of vector $\vec{A}=\hat{i}+\hat{j}+\hat{k}$ on vector $\vec{B}=\hat{i}+\hat{j}$?

[JEE Main 2021]

(1) $\sqrt{2\left(\hat{i}+\hat{j}+\hat{k}\right)}$ (2) $2\left(\hat{i}+\hat{j}+\hat{k}\right)$

(3) $\sqrt{2\left(\hat{i}+\hat{j}\right)}$ (4) $\left(\hat{i}+\hat{j}\right)$

$$\frac{\vec{A}\cdot\vec{B}}{B}=\frac{2}{\sqrt{2}}$$

$$\sqrt{2}\,\hat{B}=\sqrt{2}\times\frac{\hat{i}+\hat{j}}{\sqrt{2}}=\hat{i}+\hat{j}$$

Ans : (4)

QUESTION - 11

Two forces having magnitude A and $A/2$ are perpendicular to each other. The magnitude of their resultant is:

[08 April 2023 - Shift 1]

(1) $\frac{\sqrt{5}A}{4}$

(2) $\frac{\sqrt{5}A}{2}$

(3) $\frac{5A}{2}$

(4) $\frac{\sqrt{5}A^2}{2}$

$$\sqrt{(A)^2+\left(\frac{A}{2}\right)^2}$$

Ans : (2)

QUESTION - 12

When vector $\vec{A} = 2\hat{\imath} + 3\hat{\jmath} + 2\hat{k}$ is subtracted from vector $\vec{B}$, it gives a vector equal to $2\hat{\jmath}$. Then the magnitude of vector $\vec{B}$ will be:

[11 April 2023 - Shift 2]

(1) $\sqrt{5}$ (2) 3

(3) $\sqrt{6}$ (4) $\sqrt{33}$

$$\vec{B} - (2\hat{\imath} + 3\hat{\jmath} + 2\hat{k}) = 2\hat{\jmath}$$

$$\vec{B} = 2\hat{\imath} + 5\hat{\jmath} + 2\hat{k}$$

Ans : (4)

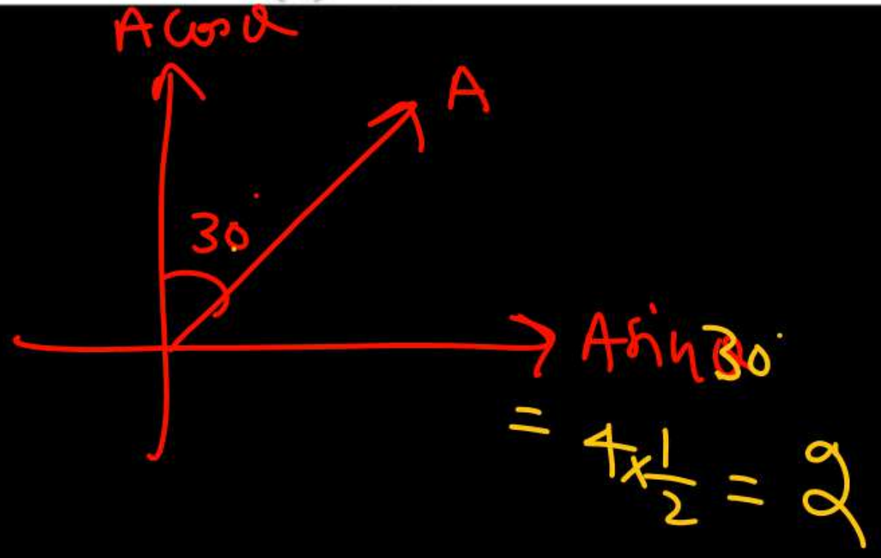
QUESTION - 13

A vector in $x-y$ plane makes an angle of $30°$ with y-axis. The magnitude of y-component of vector is $2\sqrt{3}$. The magnitude of x-component of the vector will be:

[15 April 2023 - Shift 1]

(1) $1/\sqrt{3}$ (2) 6

(3) 2 (4) $\sqrt{3}$



$= 4 \times \frac{1}{2} = 2$

$A\cos\theta = 2\sqrt{3}$

$A\cos 30 = 2\sqrt{3}$

$A\,\frac{\sqrt{3}}{2} = 2\sqrt{3}$

$A = 4$

Ans : (3)

QUESTION - 14

If two vectors $\vec{A}$ and $\vec{B}$ having equal magnitude R are inclined at an angle θ, then.

[31 January 2024 - Shift 2]

(1) $|\vec{A}-\vec{B}|=\sqrt{2}R\sin\left(\frac{\theta}{2}\right)$

(2) $|\vec{A}+\vec{B}|=2R\sin\left(\frac{\theta}{2}\right)$

(3) $|\vec{A}+\vec{B}|=2R\cos\left(\frac{\theta}{2}\right)$

(4) $|\vec{A}-\vec{B}|=2R\cos\left(\frac{\theta}{2}\right)$

Ans : (3)

QUESTION - 15

A vector has magnitude same as that of $\vec{A}=3\hat{i}+4\hat{j}$ and is parallel to $\vec{B}=4\hat{i}+3\hat{j}$. The x and y components of this vector in first quadrant are x and 3 respectively where $x =$ _____.

[30 January 2024 - Shift 2]

$\vec{P} = 5\cdot\hat{B} = 5\left(\frac{4\hat{i}+3\hat{j}}{5}\right)$

$\vec{P} = 4\hat{i}+3\hat{j}$

$x = 4$

$y = 3$

Ans : (4)

QUESTION - 16

Two forces $\vec{F}_1$ and $\vec{F}_2$ are acting on a body. One force has magnitude thrice that of the other force and the resultant of the two forces is equal to the force of larger magnitude. The angle between $\vec{F}_1$ and $\vec{F}_2$ is $\cos^{-1}\left(\frac{1}{n}\right)$. The value of $|n|$ is _____.

[04 April 2024 - Shift 1]

$x, 3x, 3x$

$C = \sqrt{A^2 + B^2 + 2AB\cos\theta}$

$(3x)^2 = x^2 + (3x)^2 + 2 \times 3x \cos\theta$

$-x^2 = 6x^2 \cos\theta$

$\cos\theta = -\frac{1}{6}$

Ans : (6)

QUESTION - 17

The angle between vector $\vec{Q}$ and the resultant of $(2\vec{Q}+2\vec{P})$ and $(2\vec{Q}-2\vec{P})$ is: **[05 April 2024 - Shift 1]**

(1) $\tan^{-1}\dfrac{(2\vec{Q}-2\vec{P})}{2\vec{Q}+2\vec{P}}$

(2) $0°$

(3) $\tan^{-1}(P/Q)$

(4) $\tan^{-1}(2Q/P)$

$\vec{\theta}$ - $4\vec{\theta}$

$2\vec{\theta}+2\vec{P}+2\vec{\theta}-2\vec{P}$

$= 4\vec{\theta}$

Ans : (2)

QUESTION - 18

If $\vec{a}$ and $\vec{b}$ makes an angle $\cos^{-1}\left(\frac{5}{9}\right)$ with each other, then $|\vec{a}+\vec{b}|=\sqrt{2}|\vec{a}-\vec{b}|$ for $|\vec{a}|=n|\vec{b}|$. The integer value of n is 3.

[09 April 2024 - Shift 1]

$a^2+b^2+2ab\cos\theta = 2(a^2+b^2-2ab\cos\theta)$

$n^2b^2+b^2+2n.b^2\cos\theta = 2(n^2b^2+b^2-2nb^2\cos\theta)$

$a = nb$

$n^2+1+2n\frac{5}{9} = 2n^2+2-4n\frac{5}{9}$

$n^2+1-\frac{30}{9}n=0$

$9n^2-30n+9=0$

$3n^2-10n+3=0$

$3n^2-9n-n+3=0$

$3n(n-3)-1(n-3)=0$

$n=3,\ n=\frac{1}{3}$

Ans : (3)

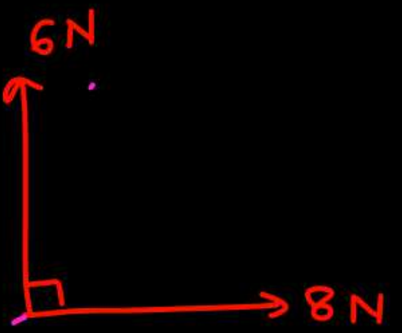
QUESTION - 19

Three forces $F_1 = 10$ N, $F_2 = 8$ N, $F_3 = 6$ N are acting on a particle of mass 5 kg. The forces F_2 and F_3 are applied perpendicularly so that particle remains at rest. If the force F_1 is removed, then the acceleration of the particle is:

[12 April 2023 - Shift 1]

(1) $7\ ms^{-2}$ (2) $0.5\ ms^{-2}$

(3) $4.8\ ms^{-2}$ (4) $2\ ms^{-2}$



$a = \frac{F_{net}}{m}$ $a = \frac{10}{5} = 2$

Ans : (4)

QUESTION - 20

Two particles are located at equal distance from origin. The position vectors of those are represented by $\overline{A}=2\hat{i}+3n\hat{j}+2\hat{k}$ and $\overline{B}=2\hat{i}-2\hat{j}+4p\hat{k}$, respectively. If both the vectors are at right angle to each other, the value of n^{-1} is _____.

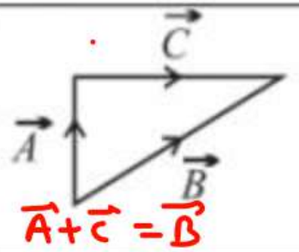
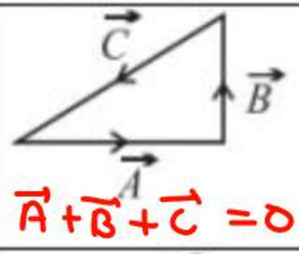
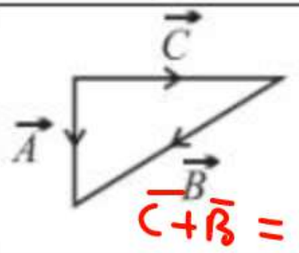
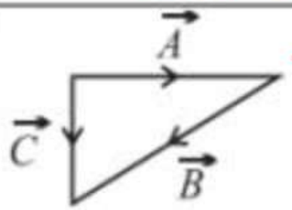
[23 Jan. 2025 - Shift 1]

Ans : (3)

QUESTION - 21

Match List I with List II.

[JEE Main 2021]

List I		List II.	
(a)	$\vec{C}-\vec{A}-\vec{B}=0$ $\vec{C}=\vec{A}+\vec{B}$	(i)	 $\vec{A}+\vec{C}=\vec{B}$
(b)	$\vec{A}-\vec{C}-\vec{B}=0$ $\vec{A}=\vec{C}+\vec{B}$	(ii)	 $\vec{A}+\vec{B}+\vec{C}=0$
(c)	$\vec{B}-\vec{A}-\vec{C}=0$	(iii)	 $\vec{C}+\vec{B}=\vec{A}$
(d)	$\vec{A}+\vec{B}=-\vec{C}$	(iv)	 $\vec{A}+\vec{B}=\vec{C}$

Choose the correct answer from the options given below:

(1) (a)→(iv), (b)→(i), (c)→(iii), (d)→(ii)

(2) (a)→(iv), (b)→(iii), (c)→(i), (d)→(ii)

(3) (a)→(iii), (b)→(ii), (c)→(iv), (d)→(i)

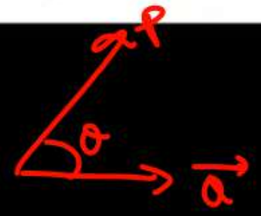
(4) (a)→(i), (b)→(iv), (c)→(ii), (d)→(iii)

Ans : (2)

QUESTION - 22

The sum of two $\vec{P}$ and $\vec{Q}$ is $\vec{R}$ such that $|\vec{R}| = |\vec{P}|$. The angle θ (in degree) that the resultant of $2\vec{P}$ and $\vec{Q}$ will make $\vec{Q}$ is:

[JEE Main 2020]

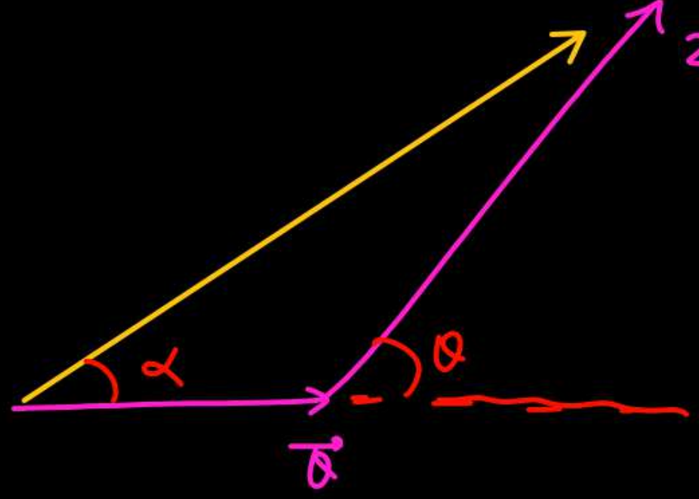


$\vec{P} + \vec{Q} = \vec{R}$

$R = \sqrt{P^2 + Q^2 + 2PQ\cos\theta} = P$

$Q^2 + 2PQ\cos\theta = 0$

$Q + 2P\cos\theta = 0$



$\tan\alpha = \dfrac{P_{\text{नया}}\sin\theta}{Q + P_{\text{नया}}\cos\theta} = \dfrac{2P\sin\theta}{Q + 2P\cos\theta}$

$\tan\alpha = \dfrac{(\ )}{0} \to \infty$

$\alpha = 90^\circ$

Ans : (90)

QUESTION - 23

If $\vec{A}$ and $\vec{B}$ are two vectors satisfying the relation $\vec{A} \cdot \vec{B} = |\vec{A} \times \vec{B}|$. Then the value of $|\vec{A} - \vec{B}|$ will be:

[JEE Main 2021]

(1) $\sqrt{A^2 + B^2}$

(2) $\sqrt{A^2 + B^2 + \sqrt{2}AB}$

(3) $\sqrt{A^2 + B^2 + 2AB}$

(4) $\sqrt{A^2 + B^2 - \sqrt{2}AB}$

$AB\cos\theta = AB\sin\theta$

$\theta = 45^\circ$

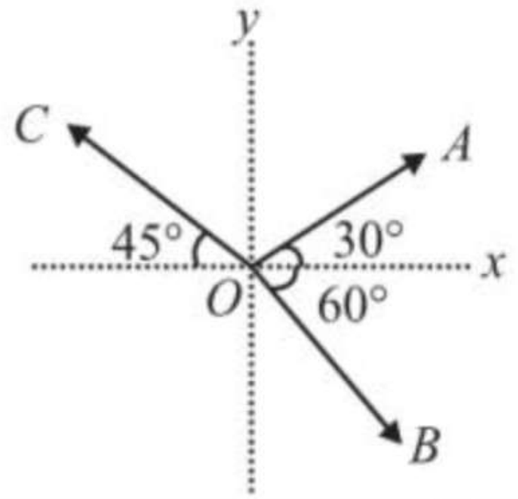
$\sqrt{A^2 + B^2 - 2AB\cos 45}$

Ans : (4)

QUESTION - 24

The magnitude of vectors $\overrightarrow{OA}, \overrightarrow{OB}$ and $\overrightarrow{OC}$ in the given figure are equal. The direction of $\overrightarrow{OA} + \overrightarrow{OB} - \overrightarrow{OC}$ with x-axis will be:

[JEE Main 2021]



(1) $\tan^{-1}\dfrac{(1-\sqrt{3}-\sqrt{2})}{(1+\sqrt{3}+\sqrt{2})}$

(2) $\tan^{-1}\dfrac{(\sqrt{3}-1+\sqrt{2})}{(1+\sqrt{3}-\sqrt{2})}$

(3) $\tan^{-1}\dfrac{(\sqrt{3}-1+\sqrt{2})}{(1-\sqrt{3}+\sqrt{2})}$

(4) $\tan^{-1}\dfrac{(1+\sqrt{3}-\sqrt{2})}{(1-\sqrt{3}-\sqrt{2})}$

$\vec{OA} = x\frac{\sqrt{3}}{2}\hat{i} + \frac{x}{2}\hat{j}$

$\vec{OB} = \frac{x}{2}\hat{i} - \frac{x\sqrt{3}}{2}\hat{j}$

$\vec{OC} = -\frac{x}{\sqrt{2}}\hat{i} + \frac{x}{\sqrt{2}}\hat{j}$

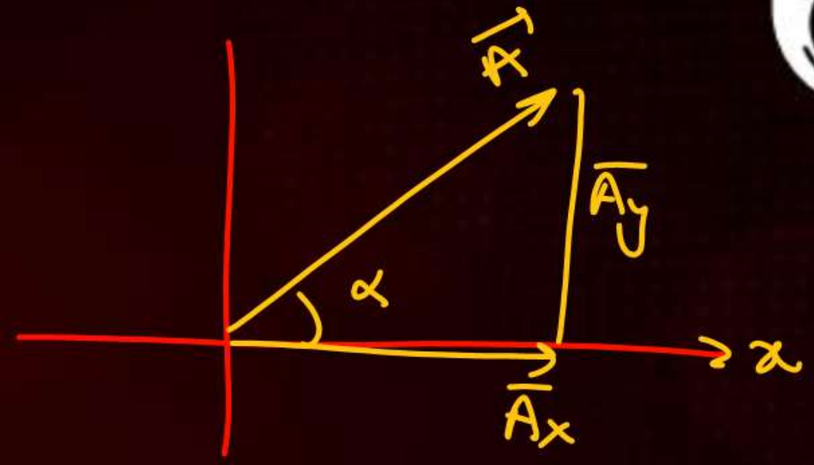
$\vec{OA} + \vec{OB} - \vec{OC}$

$= x\left(\frac{\sqrt{3}}{2} + \frac{1}{2} + \frac{\sqrt{2}}{2}\right)\hat{i}$

$+ x\left(\frac{1}{2} - \frac{\sqrt{3}}{2} - \frac{\sqrt{2}}{2}\right)\hat{j}$

$\tan\alpha = \dfrac{x\left(\frac{1}{2} - \frac{\sqrt{3}}{2} - \frac{\sqrt{2}}{2}\right)}{x\left(\frac{\sqrt{3}}{2} + \frac{1}{2} + \frac{\sqrt{2}}{2}\right)} = \dfrac{1-\sqrt{3}-\sqrt{2}}{\sqrt{3}+1+\sqrt{2}}$

Ans : (1)

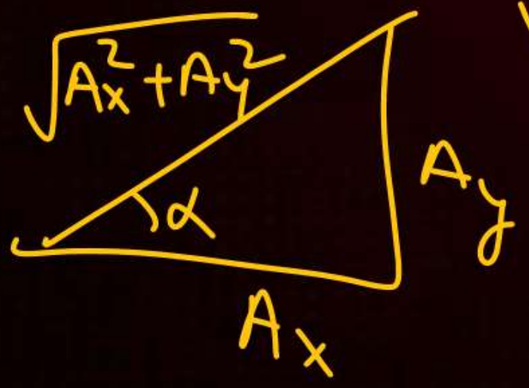


$\vec{A} = A_x\hat{i} + A_y\hat{j}$

x-Axis के साथ angle $\alpha \Rightarrow \tan\alpha = \frac{A_y}{A_x}$

$\tan\alpha = \frac{A_y}{A_x}$

$\cos\alpha = \frac{A_x}{\sqrt{A_x^2 + A_y^2}}$



$\vec{P} = 4\hat{i} + 10\hat{j}$

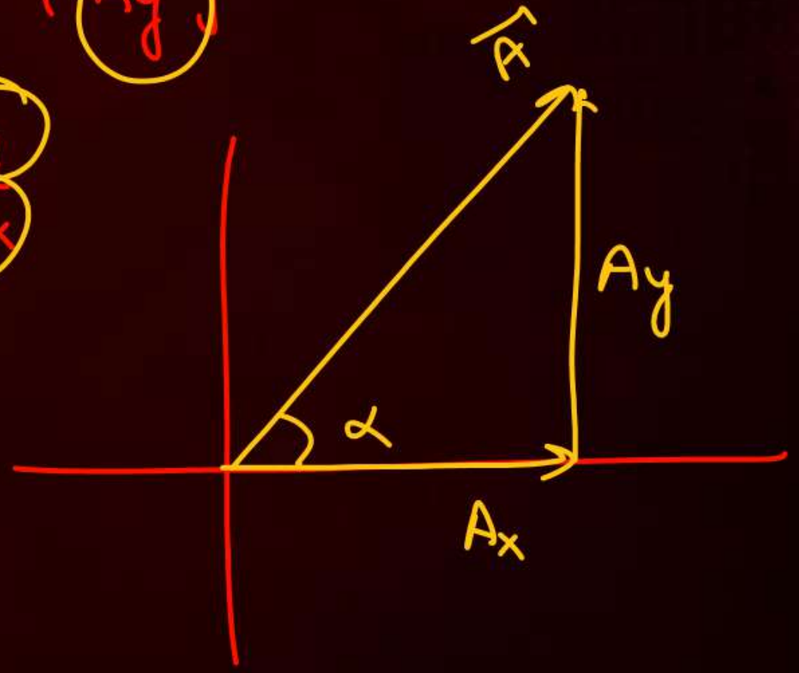
$\tan\alpha = \frac{10}{4}$

$\vec{A} = 3\hat{i} + 4\hat{j}$

$\tan\alpha = \frac{4}{3}$

$\vec{A} = A_x\hat{i} + A_y\hat{j}$

$\tan\alpha = \frac{A_y}{A_x}$



$A = 10$

$B = 6$

$C = 3$

$A + B - C$

$10 + 6 - 3$

$A + B + (-C)$

QUESTION - 25

Two vectors $\vec{P}$ and $\vec{Q}$ have equal magnitudes. If the magnitude of $\vec{P}+\vec{Q}$ is n times the magnitude of $\vec{P}-\vec{Q}$, then angle between $\vec{P}$ and $\vec{Q}$ is:

[(JEE Main 2021]

(1) $\sin^{-1}\left(\frac{n-1}{n+1}\right)$ (2) $\cos^{-1}\left(\frac{n-1}{n+1}\right)$

(3) $\sin^{-1}\left(\frac{n^2-1}{n^2+1}\right)$ (4) $\cos^{-1}\left(\frac{n^2-1}{n^2+1}\right)$

$\sqrt{P^2+Q^2+2PQ\cos\theta} = n\sqrt{P^2+Q^2-2PQ\cos\theta}$

$x^2+x^2+2x^2\cos\theta = n^2(x^2+x^2-2x^2\cos\theta)$

$\cos\theta =$ ✓

Ans : (4)

QUESTION - 26

Two vectors $\vec{X}$ and $\vec{Y}$ have equal magnitude. The magnitude of $(\vec{X}-\vec{Y})$ is n times the magnitude of $(\vec{X}+\vec{Y})$. The angle between $\vec{X}$ and $\vec{Y}$ is:

[JEE Main 2021]

(1) $\cos^{-1}\left(\frac{-n^2-1}{n^2-1}\right)$ (2) $\cos^{-1}\left(\frac{n^2-1}{-n^2-1}\right)$

(3) $\cos^{-1}\left(\frac{n^2+1}{-n^2-1}\right)$ (4) $\cos^{-1}\left(\frac{n^2+1}{n^2-1}\right)$

$$|\vec{x}-\vec{y}| = n\,|\vec{x}+\vec{y}|$$

$$\sqrt{x^2+x^2-2x\cdot x\cos\theta} = n\sqrt{x^2+x^2+2x\cdot x\cos\theta}$$

$$2-2\cos\theta = n^2(2+2\cos\theta)$$

$$1-\cos\theta = n^2(1+\cos\theta)$$

$$1-\cos\theta = n^2+n^2\cos\theta$$

$$\cos\theta\left(-1-n^2\right) = n^2-1$$

Ans : (2)

QUESTION - 27

The angle between vector $(\vec{A})$ and $(\vec{A}-\vec{B})$ is:

[JEE Main 2021]

(1) $\tan^{-1}\left(\dfrac{-\frac{B}{2}}{A-B\frac{\sqrt{3}}{2}}\right)$

(2) $\tan^{-1}\left(\dfrac{A}{0.7B}\right)$

(3) $\tan^{-1}\left(\dfrac{\sqrt{3}B}{2A-B}\right)$

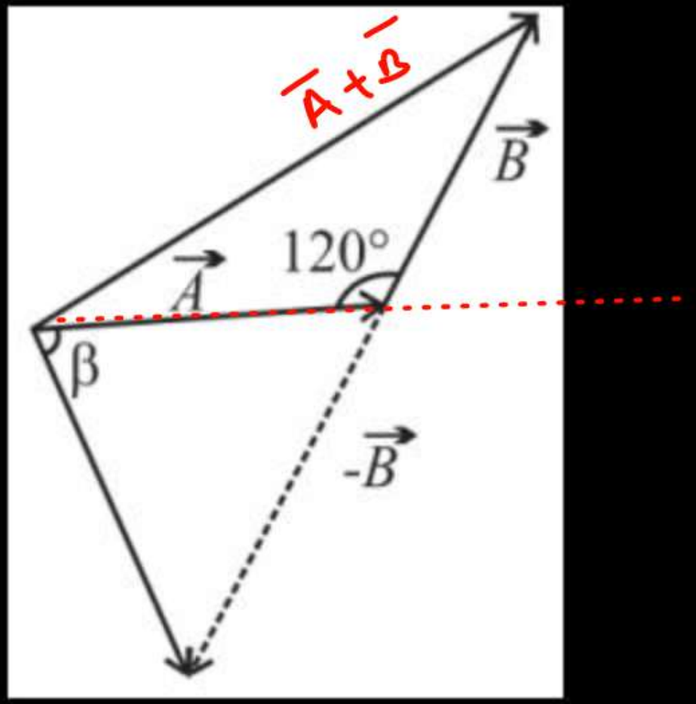
(4) $\tan^{-1}\left(\dfrac{B\cos\theta}{2-B\sin\theta}\right)$

$\vec{A}$ और $\vec{B}$ के बीच Angle $\Rightarrow 60^\circ$

$\vec{R}=\vec{A}-\vec{B}$

$$\tan\alpha=\frac{B\sin\theta}{A-B\cos\theta}=\frac{B\cdot\sqrt{3}/2}{A-B/2}$$

$$=\frac{B\sqrt{3}}{2A-B}$$



Ans : (3)

QUESTION - 28

$\vec{F}_1 + \vec{F}_2 - \vec{F}_3 = 0$

Statement I: If three forces $\vec{F}_1, \vec{F}_2$ and $\vec{F}_3$ are represented by three sides of a triangle and $\vec{F}_1 + \vec{F}_2 = \vec{F}_3$, then these three forces are concurrent forces and satisfy the condition for equilibrium. $\vec{F}_1 + \vec{F}_2 + \vec{F}_3 = 0$

Statement II: A triangle made up of three forces $\vec{F}_1, \vec{F}_2$ and $\vec{F}_3$ as its sides taken in the same order, satisfy the condition for translatory equilibrium.

In the light of the above statements, choose the most appropriate answer from the options given below:

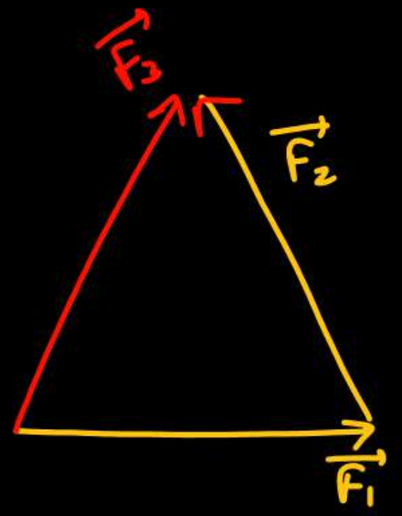
[JEE Main 2021]

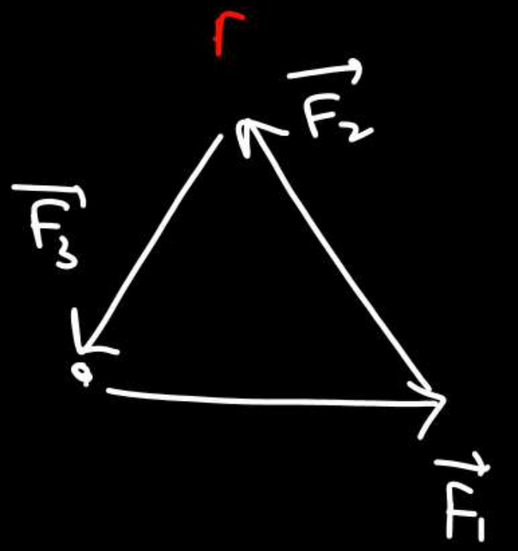
(1) Statement-I is false but Statement-II is true

(2) Statement-I is true but Statement-II is false

(3) Both Statement-I and Statement-II are false

(4) Both Statement-I and Statement-II are true





Correct

(2)

Ans : (4)

QUESTION - 28

correchim

Statement I: If three forces $\vec{F}_1, \vec{F}_2$ and $\vec{F}_3$ are represented by three sides of a triangle and $\vec{F}_1 + \vec{F}_2 = \vec{F}_3$, then these three forces are concurrent forces and satisfy the condition for equilibrium.

Statement II: A triangle made up of three forces $\vec{F}_1, \vec{F}_2$ and $\vec{F}_3$ as its sides taken in the same order, satisfy the condition for translatory equilibrium.

In the light of the above statements, choose the most appropriate answer from the options given below:

[JEE Main 2021]

(1) Statement-I is false but Statement-II is true

(2) Statement-I is true but Statement-II is false

(3) Both Statement-I and Statement-II are false

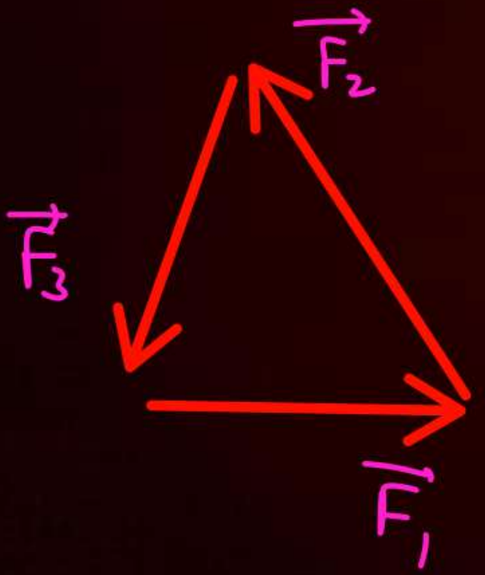
(4) Both Statement-I and Statement-II are true

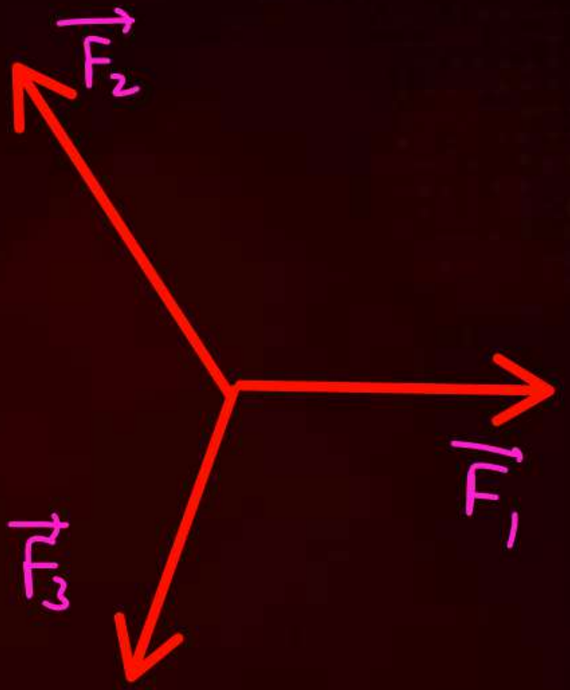
$\vec{F_1} + \vec{F_2} = -\vec{F_3}$

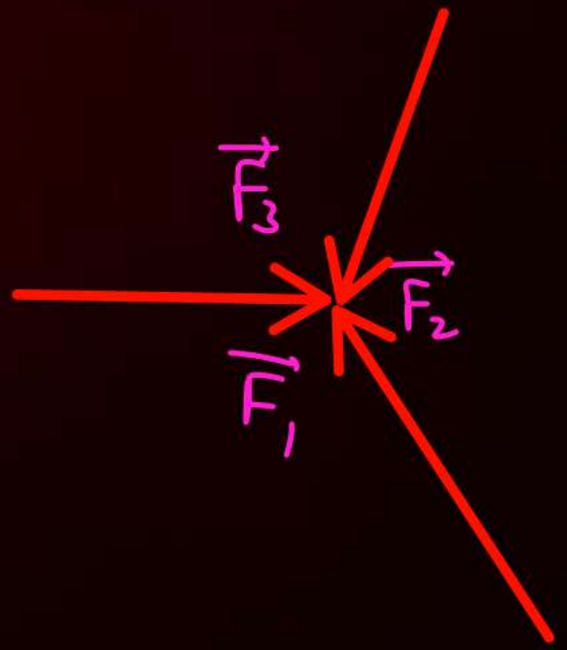
$\vec{F_1} + \vec{F_2} + \vec{F_3} = 0$

Ans : (4)

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





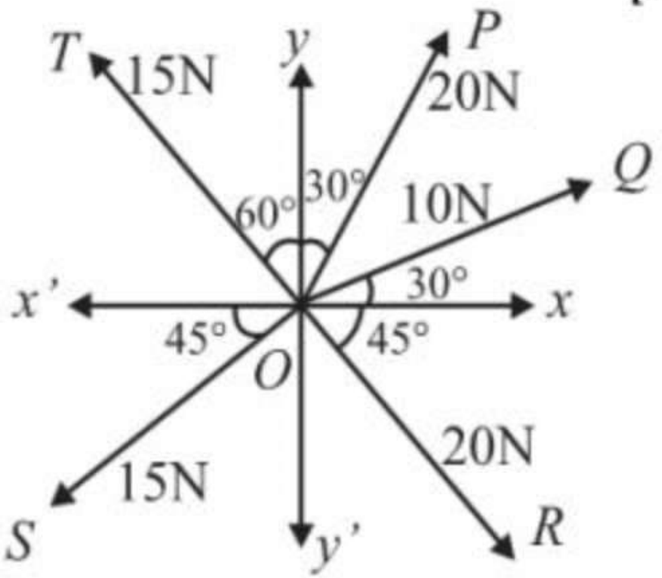


QUESTION - 29

The resultant of these forces $\overrightarrow{OP}, \overrightarrow{OQ}, \overrightarrow{OR}, \overrightarrow{OS}$ and $\overrightarrow{OT}$ is approximately N.

[Take $\sqrt{3} = 1.7$, $\sqrt{2} = 1.4$ Given $\hat{i}$ and $\hat{j}$ unit vectors along x, y axis].

[JEE Main 2021]



(1) $9.25\hat{i} + 5\hat{j}$ (2) $3\hat{i} + 15\hat{j}$

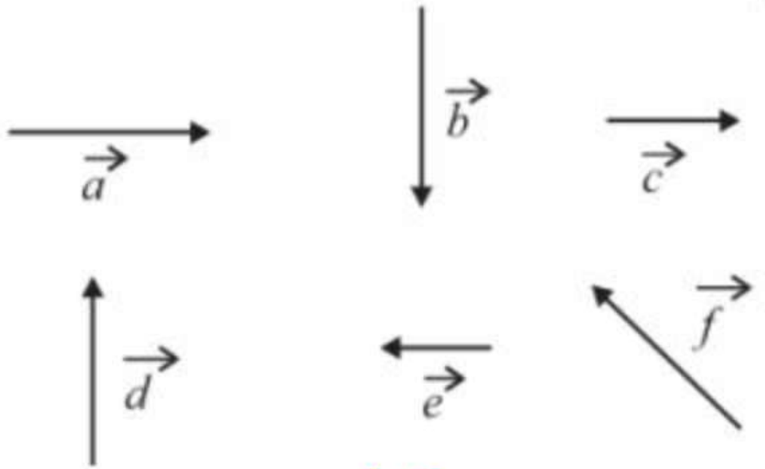
(3) $2.5\hat{i} - 14.5\hat{j}$ (4) $-1.5\hat{i} - 15.5\hat{j}$

Ans : (1)

QUESTION - 30

Six vectors, $\vec{a}$ through $\vec{f}$ fhave the magnitudes and directions indicated in the figure. Which of the following statements is true?

[NEET - 2010]

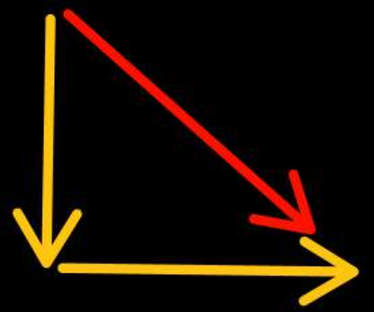


(1) $\vec{b}+\vec{c}=\vec{f}$

(2) $\vec{d}+\vec{c}=\vec{f}$

(3) $\vec{d}+\vec{e}=\vec{f}$

(4) $\vec{b}+\vec{e}=\vec{f}$



Ans : (3)

QUESTION - 31

If a unit vector is represented by $0.5\hat{i} - 0.8\hat{j} + c\hat{k}$ then the value of c is:

[NEET - 1999]

(1) $\sqrt{0.01}$ (2) $\sqrt{0.11}$

(3) 1 (4) $\sqrt{0.39}$

$$\sqrt{(.5)^2 + (.8)^2 + (c)^2} = 1$$

$$\frac{25}{100} + \frac{64}{100} + c^2 = \frac{100}{100}$$

$$c^2 = \frac{11}{100}$$

Ans : (2)

QUESTION - 32

If the magnitude of sum of two vectors is equal to the magnitude of difference of the two vectors, the angle between these vectors is:

[NEET-I, 2016]

(1) 45°
(2) 180°
(3) 0°
(4) 90°

$|\vec{A}+\vec{B}| = |\vec{A}-\vec{B}|$

Ans : (4)

QUESTION - 33

The vectors $\vec{A}$ and $\vec{B}$ are such that $|\vec{A}+\vec{B}|=|\vec{A}-\vec{B}|$. The angle between the two vectors is:

[NEET - 2006, 1996, 1991]

(1) 45°
(2) 90°
(3) 60°
(4) 75°

Ans : (2)

QUESTION - 34

If $|\vec{A}+\vec{B}|=|\vec{A}|+|\vec{B}|$ then angle between A and B will be:

[NEET - 2001]

(1) $90°$ (2) $120°$

(3) $0°$ (4) $60°$

$$\sqrt{A^2+B^2+2AB\cos\theta} = A+B$$

$$A^2+B^2+2AB\cos\theta = A^2+B^2+2AB$$

$$\cos\theta = 1$$

Ans : (3)

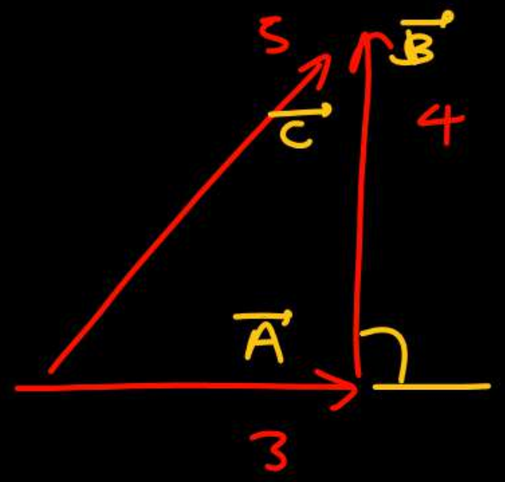
QUESTION - 35

The magnitude of vectors $\vec{A}, \vec{B}$ and $\vec{C}$ are 3, 4 and 5 units respectively. If $\vec{A}+\vec{B}=\vec{C}$, the angle between $\vec{A}$ and $\vec{B}$ is:

[NEET - 1988]

(1) $\pi/2$ (2) $\cos^{-1}(0.6)$

(3) $\tan^{-1}(7/5)$ (4) $\pi/4$



Ans : (1)

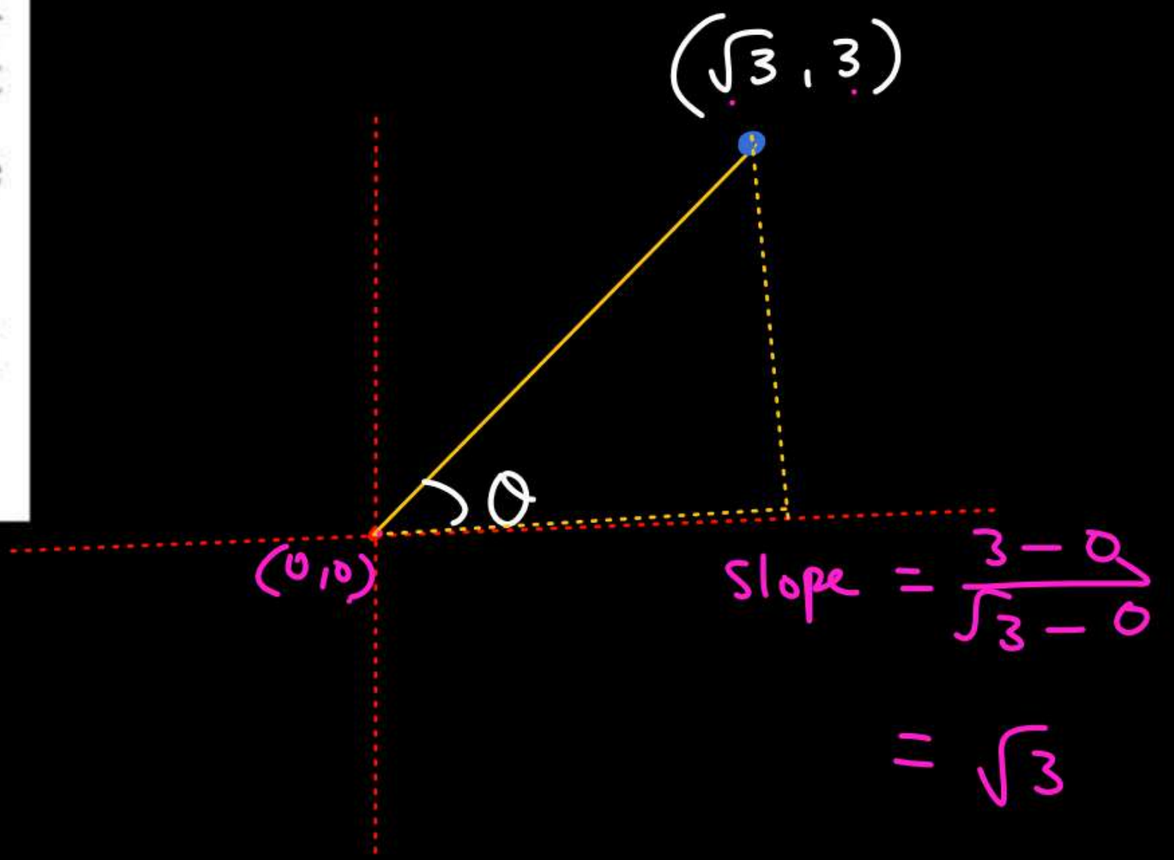
QUESTION - 36

A particle starting from the origin (0, 0) moves in a straight line in the (x, y) plane. Its coordinates at a later time are $\left(\sqrt{3}, 3\right)$. The path of the particle makes with the x-axis an angle of

[NEET - 2007]

(1) 45° (2) 60°

(3) 0° (4) 30°



$$\tan\theta = \frac{3}{\sqrt{3}}$$

$$\tan\theta = \sqrt{3}$$

$$\theta = 60^\circ$$

Ans : (2)

THANK YOU