MATHS

BOOKS - JEE MAINS PREVIOUS YEAR

VECTOR ALGEBRA

Others

1. Let $\bar{a} = \hat{i} + \hat{j} + \hat{k}, b = \hat{i} - \hat{j} + 2\hat{k}$ and $\bar{c} = x\hat{i} + (x-2)\hat{j} - \hat{k}$. If the vector c lies in

the plane of a and b , then x equals (1) 0 (2) 1

(3) -4 (4) -2

Watch Video Solution

2. The nonzero verctors $\vec{a}$, $\vec{b}$ and $\vec{c}$ are related by $\vec{a} = 8\vec{b}$ and $\vec{c} = -7\vec{b}$.

Then the angle between $\vec{a}$ and $\vec{c}$ is

Watch Video Solution

3. The vector $\overrightarrow{a} = \alpha\hat{i} + 2\hat{j} + \beta\hat{k}$ lies in the plane of the vectors $\overrightarrow{b} = \hat{\mathrm{i}} + \hat{j}$ and $\overrightarrow{c} = \hat{j} + \hat{k}$ and bisects the angle between $\overrightarrow{b}$ and $\overrightarrow{c}$. Then which one of the following gives possible values of α and β ? (1) $\alpha = 2, \beta = 2$ (2) $\alpha = 1, \beta = 2$ (3) $\alpha = 2, \beta = 1$ (4) $\alpha = 1, \beta = 1$

A. $\alpha = 2, \beta = 2$

B. $\alpha = 1, \beta = 2$

C. $\alpha = 2, \beta = 1$

D. $\alpha = 1, \beta = 1$

Answer: D

Watch Video Solution

4. Let $\hat{a}$ and $\hat{b}$ be two unit vectors. If the vectors $\vec{c} = \hat{a} + 2\hat{b}$ and $\vec{d} = 5\hat{a} - 4\hat{b}$ are perpendicular to each other, then the angle between $\hat{a}$ and $\hat{b}$ is

A. $\frac{\pi}{6}$

B. $\frac{\pi}{2}$

C. $\frac{\pi}{3}$

D. $\frac{\pi}{4}$

Answer: C

Watch Video Solution

5. If the vectors $\overline{AB} = 3\hat{i} + 4\hat{k}$ and $\overline{AC} = 5\hat{i} - 2\hat{j} + 4\hat{k}$ are the sides of a triangle ABC, then the length of the median through A is

A. $\sqrt{72}$

B. $\sqrt{33}$

C. $\sqrt{45}$

D. $\sqrt{18}$

Answer: B

Watch Video Solution

6. If

$$\left[\vec{a} \times \vec{b}\,\vec{b} \times \vec{c}\,\vec{c} \times \vec{a}\right] = \lambda\left[\vec{a}\,\vec{b}\,\vec{c}\right]^2 \quad ,$$

then l is equal to (1) 2 (2) 3 (3) 0 (4) 1

Watch Video Solution

7. Let $\vec{a}$, $\vec{b}$ and $\vec{c}$ be three non-zero vectors such that no two of them are collinear and $\left(\vec{a} \times \vec{b}\right) \times \vec{c} = \frac{1}{3}\left|\vec{c}\right|\left|\vec{b}\right|\vec{a}$. If θ is the angle between vectors $\vec{b}$ and $\vec{c}$ then a value of $\sin\theta$ is :

Watch Video Solution

8. Let $\vec{a}$, $\vec{b}$ and $\vec{c}$ be there unit vectors such that $\vec{a} \times \left(\vec{b} \times \vec{c}\right) = \frac{\sqrt{3}}{2}\left(\vec{b} + \vec{c}\right)$. If $\vec{b}$ is not parallel to $\vec{c}$, then the angle between $\vec{a}$ and $\vec{b}$ is: (1) $\frac{3\pi}{4}$ (2) $\frac{\pi}{2}$ (3) $\frac{2\pi}{3}$ (4) $\frac{5\pi}{6}$

Watch Video Solution