VECTORS

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1 CLASS 10

1. The distance between the points $(m, -n)$ and $(-m, n)$ is

   (a) $\sqrt{m^2 + n^2}$

   (b) $m + n$

   (c) $2\sqrt{m^2 + n^2}$

   (d) $\sqrt{2m^2 + 2n^2}$

2. The point on the x-axis which is equidistant from $(-4, 0)$ and $(10, 0)$ is

   (a) $(7, 0)$

   (b) $(5, 0)$

   (c) $(0, 0)$

   (d) $(3, 0)$

3. The centre of a circle whose end points of a diameter are $(-6, 3)$ and $(6, 4)$ is

   (a) $(8, -1)$

   (b) $(4, 7)$

   (c) $\left(0, \frac{7}{2}\right)$

   (d) $\left(4, \frac{7}{2}\right)$

4. $AOBC$ is a rectangle whose three vertices are **A** $(0, -3)$, **O** $(0, 0)$ and **B** $(4, 0)$. The length of its diagonal is _____.

5. Find the ratio in which the $y - axis$ divides the line segment joining the points $(6, -4)$ and $(-2, -7)$. Also find the point of intersection.

6. Show that the points $(7, 10)$, $(-2, 5)$ and $(3, 4)$ are vertices of an isosceles right triangle.

2 CLASS 12

1. The area of a triangle formed by vertices **O**, **A** and **B**, where $\overrightarrow{OA} = \hat{i} + 2\hat{j} + 3\hat{k}$ and $\overrightarrow{OB} = -3\hat{i} - 2\hat{j} + \hat{k}$ is

   (a) $3\sqrt{5}$ sq. units

   (b) $5\sqrt{5}$ sq. units

   (c) $6\sqrt{5}$ sq. units

   (d) 4 sq. units

2. The coordinates of the foot of the perpendicular drawn from the point $(2, -3, 4)$ on the $y - axis$ is

   (a) $(2, 3, 4)$

   (b) $(-2, -3, -4)$

   (c) $(0, -3, 0)$

   (d) $(2, 0, 4)$

3. The angle between the vectors $\hat{i} - \hat{j}$ and $\hat{j} - \hat{k}$ is

   (a) $\frac{-\pi}{3}$

   (b) 0

   (c) $\frac{\pi}{3}$

   (d) $\frac{2\pi}{3}$

4. If $\left|\overrightarrow{a}\right| = 4$ and $-3 \leq \lambda \leq 2$, then $\left|\lambda\overrightarrow{a}\right|$ lies in

   (a) $[0, 12]$

(b) $[2, 3]$

(c) $[8, 12]$

(d) $[-12, 8]$

5. The distance between parallel planes $2x+y-2z-6=0$ and $4x+2y-4z=0$ is _____ units.

6. If $\mathbf{P}(1, 0, -3)$ is the foot of the perpendicular from the origin to the plane, then the cartesian equation of the plane is _____.

7. Find the coordinates of the point where the line $\frac{x-1}{3} = \frac{y+4}{7} = \frac{z+4}{2}$ cuts the $xy-plane$.

8. Find a vector $\vec{r}$ equally inclined to the three axes and whose magnitude is $3\sqrt{3}$ units.

9. Find the angle between unit vectors $\vec{a}$ and $\vec{b}$ so that $\sqrt{3}\vec{a}$ - $\vec{b}$ is also a unit vector.

10. Show that the plane $x - 5y - 2z = 1$ contains the line $\frac{x-5}{3} = y = 2 - z$.

11. Find the equation of the plane passing through the points $(1, 0, -2)$, $(3, -1, 0)$ and perpendicular to the plane $2x - y + z = 8$. Also find the distance of the plane thus obtained from the origin.