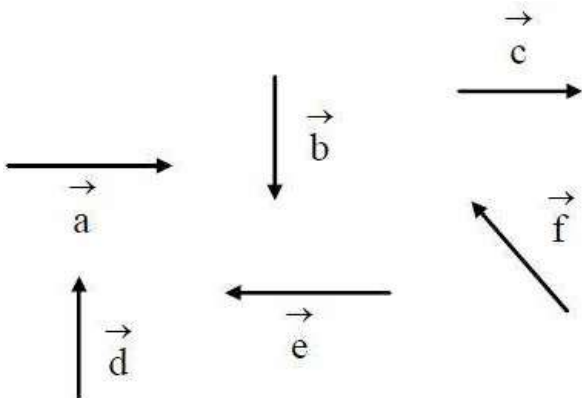


PHYSICS

Motion in a Plane

Vectors

- 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
 (1) 0° (2) 90°
 (3) 45° (4) 180°
- A particle is moving such that its position coordinate (x, y) are
 (2m, m) at time $t = 0$
 (6m, 7m) at time $t = 2$ s and
 (13 m, 14 m) at time $t = 5$ s
 Average velocity vector (\vec{V}_{av}) from $t = 0$ to $t = 5$ s is
 (1) $\frac{1}{5}(13\hat{i} + 14\hat{j})$
 (2) $\frac{7}{3}(\hat{i} + \hat{j})$
 (3) $2(\hat{i} + \hat{j})$
 (4) $\frac{11}{5}(\hat{i} + \hat{j})$
- Six vectors, \vec{a} through \vec{f} have the magnitudes and directions indicated in the figure. Which of the following statements is true?



- | | |
|-----------------------------------|-----------------------------------|
| (1) $\vec{b} + \vec{c} = \vec{f}$ | (2) $\vec{d} + \vec{c} = \vec{f}$ |
| (3) $\vec{d} + \vec{e} = \vec{f}$ | (4) $\vec{b} + \vec{e} = \vec{f}$ |

- \vec{A} and \vec{B} are two vectors and θ is the angle between them, if $|\vec{A} \times \vec{B}| = \sqrt{3}(\vec{A} \cdot \vec{B})$, the value of θ is
 (1) 45° (2) 30°
 (3) 90° (4) 60°
- 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
 (1) 60° (2) 75°
 (3) 45° (4) 90°
- If a vector $2\hat{i} + 3\hat{j} + 8\hat{k}$ is perpendicular to the vector $4\hat{j} - 4\hat{i} + \alpha\hat{k}$, then the value of α is
 (1) $\frac{1}{2}$ (2) $-\frac{1}{2}$
 (3) 1 (4) -1
- The vector sum of two forces is perpendicular to their vector differences. In that case, the forces
 (1) cannot be predicted
 (2) are equal to each other
 (3) are equal to each other in magnitude
 (4) are not equal to each other in magnitude
- The angle between the two vectors $\vec{A} = 3\hat{i} + 4\hat{j} + 5\hat{k}$ and $\vec{B} = 3\hat{i} + 4\hat{j} - 5\hat{k}$ will be
 (1) 0° (2) 45°
 (3) 90° (4) 180°
- If a unit vector is represented by $0.5\hat{i} + 0.8\hat{j} + c\hat{k}$, the value of c is
 (1) 1 (2) $\sqrt{0.11}$
 (3) $\sqrt{0.01}$ (4) 0.39
- Which of the following is not a vector quantity?
 (1) displacement
 (2) electric field
 (3) work
 (4) acceleration

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