

Motion Along a Straight Line-1

- Two vectors \vec{A} and \vec{B} lie in a plane, another vector \vec{C} lies outside this plane, then the resultant of these vectors i.e. $\vec{A} + \vec{B} + \vec{C}$:
(A) can be zero
(B) cannot be zero
(C) lies in the plane containing \vec{A} & \vec{B}
(D) lies in the plane containing \vec{B} & \vec{C}
- The resultant of \vec{A} and \vec{B} makes an angle α with \vec{A} and β with \vec{B} , then
(A) $\alpha < \beta$ (B) $\alpha < \beta$ if $A < B$
(C) $\alpha < \beta$ if $A > B$ (D) $\alpha < \beta$ if $A = B$
- Which of the following sets of concurrent forces may be in equilibrium?
(A) $F_1 = 3\text{N}, F_2 = 5\text{N}, F_3 = 1\text{N}$
(B) $F_1 = 3\text{N}, F_2 = 5\text{N}, F_3 = 9\text{N}$
(C) $F_1 = 3\text{N}, F_2 = 5\text{N}, F_3 = 6\text{N}$
(D) $F_1 = 3\text{N}, F_2 = 5\text{N}, F_3 = 15\text{N}$
- Two vectors of equal magnitude have a resultant equal to either of them in magnitude. The angle between them is
(A) 60° (B) 9° (C) 105° (D) 120°
- The angle that the vector $\vec{A} = 2\hat{i} + 3\hat{j}$ makes with y-axis is
(A) $\tan^{-1}(3/2)$ (B) $\tan^{-1}(2/3)$
(C) $\sin^{-1}(2/3)$ (D) $\cos^{-1}(3/2)$
- The magnitudes of vectors \vec{A}, \vec{B} and \vec{C} are respectively 12, 5 and 13 units and $\vec{A} + \vec{B} = \vec{C}$, then the angle between \vec{A} and \vec{B} is ;
(A) 0 (B) $\pi/3$ (C) $\pi/2$ (D) $\pi/4$
- What is the component of $(3\hat{i} + 4\hat{j})$ along $(\hat{i} + \hat{j})$?
(A) $\frac{1}{2}(\hat{j} + \hat{i})$ (B) $\frac{3}{2}(\hat{j} + \hat{i})$
(C) $\frac{5}{2}(\hat{j} + \hat{i})$ (D) $\frac{7}{2}(\hat{j} + \hat{i})$

8. If $\vec{A} = 3\hat{i} + 4\hat{j}$ and $\vec{B} = 6\hat{i} + 8\hat{j}$ and A and B are the magnitudes of \vec{A} and \vec{B} , then which of the following is not true?
 (A) $\vec{A} \times \vec{B} = \vec{0}$ (B) $\frac{A}{B} = \frac{1}{2}$ (C) $\vec{A} \times \vec{B} = 48$ (D) $A = 5$
9. If $\vec{A} \times \vec{B} = \vec{0}$ and $\vec{B} \times \vec{C} = \vec{0}$, then the angle between $\vec{A} \times \vec{C}$ may be
 (A) zero (B) $\frac{\pi}{4}$ (C) $\frac{\pi}{2}$ (D) none
10. Area of a parallelogram, whose diagonals are $3\hat{i} + \hat{j} - 2\hat{k}$ and $\hat{i} - 3\hat{j} + 4\hat{k}$ will be :
 (A) 14 unit (B) $5\sqrt{3}$ unit
 (C) $10\sqrt{3}$ unit (D) $20\sqrt{3}$ unit
11. If $|\vec{A} \times \vec{B}| = \sqrt{3} \vec{A} \cdot \vec{B}$, then the value of $|\vec{A} + \vec{B}|$ is :
 (A) $(A^2 + B^2 + \frac{AB}{\sqrt{3}})^{1/2}$ (B) $A + B$
 (C) $(A^2 + B^2 + \sqrt{3}AB)^{1/2}$ (D) $(A^2 + B^2 + AB)^{1/2}$
12. If vectors $\vec{A} = \cos wt\hat{i} + \sin wt\hat{j}$ and $\vec{B} = \cos \frac{wt}{2}\hat{i} + \sin \frac{wt}{2}\hat{j}$ are functions of time, then the value of t at which they are orthogonal to each other is
 (A) $t = 0$ (B) $t = \frac{\pi}{4\omega}$
 (C) $t = \frac{\pi}{2\omega}$ (D) $t = \frac{\pi}{\omega}$
13. The resultant of two vectors \vec{P} and \vec{Q} is \vec{R} . If \vec{Q} is doubled then the new resultant vector is perpendicular to \vec{P} . Then R is equal to
 (A) $(\frac{P^2 - Q^2}{2PQ})$ (B) Q (C) $\frac{P}{Q}$ (D) $\frac{P+Q}{P-Q}$
14. Two vectors \vec{A} and \vec{B} are such that $\vec{A} + \vec{B} = \vec{A} - \vec{B}$. Then select incorrect alternative
 (A) $\vec{A} \cdot \vec{B} = 0$ (B) $\vec{A} \times \vec{B} = \vec{0}$
 (C) $\vec{A} = \vec{0}$ (D) $\vec{B} = \vec{0}$
15. Square of the resultant of two forces of equal magnitude is equal to three times the product of their magnitude. The angle between them is
 (A) 0° (B) 45° (C) 60° (D) 90°

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1-B	2-C	3-C	4-D	5-B	6-C	7-D	8-C	9-A	10-B	11-D	12-D	13-B	14-C	15-C