

Class XII
Chapter -Vector

WORKSHEET (BASIC)

A. Choose the correct option:

- If $\vec{a}=2\hat{i}+\hat{j}-8\hat{k}$ and $\vec{b}=\hat{i}-3\hat{j}-4\hat{k}$ then magnitude of $\vec{a} + \vec{b}$ is equal to
(a) 13 (b) $\frac{13}{3}$ (c) $\frac{3}{13}$ (d) $\frac{4}{13}$
- If ABCDEF is a regular hexagon then $\vec{AD} + \vec{EB} + \vec{FC}$ equal
(a) 0 (b) $2\vec{AB}$ (c) $4\vec{AB}$ (d) $3\vec{AB}$
- The points with respective position vectors $60\hat{i}+3\hat{j}$, $40\hat{i}-8\hat{j}$, $x\hat{i}-52\hat{j}$ are collinear if x is equal to
(a) -40 (b) 40 (c) 20 (d) -20
- If $|\vec{a} - \vec{b}| = |\vec{a} + \vec{b}|$ if only if
(a) \vec{a} is parallel to \vec{b} (b) \vec{a} is perpendicular to \vec{b}
(c) Angle between \vec{a} and \vec{b} are 60° (d) $|\vec{a}| = |\vec{b}|$
- If $\vec{a}, \vec{b}, \vec{c}$ are unit vectors, such that $\vec{a} + \vec{b} + \vec{c} = \vec{0}$, then the value of $\vec{a} \cdot \vec{b} + \vec{b} \cdot \vec{c} + \vec{c} \cdot \vec{a}$ is :
(a) $\frac{2}{3}$ (b) $\frac{2}{3}$ (c) $\frac{3}{2}$ (d) $-\frac{3}{2}$
- If \vec{a} and \vec{b} are two unit vectors inclined at an angle θ , then $\sin \frac{\theta}{2}$ is
(a) 1 (b) $\frac{1}{2}$ (c) $-\frac{1}{2}$ (d) none of these
- If $\vec{a} + \vec{b} + \vec{c} = \vec{0}$, then
(a) $\vec{a} \cdot \vec{b} = 0$ (b) $\vec{a} = \vec{b}$ (c) $-\vec{a} \times \vec{b} = \vec{b} \times \vec{c} = \vec{c} \times \vec{a}$ (d) none of these
- If $|\vec{a} \times \vec{b}| = 4$ and $|\vec{a} \cdot \vec{b}| = 2$ then $|\vec{a}|^2 |\vec{b}|^2 =$
(a) 2 (b) 6 (c) 8 (d) 20
- The number of vectors of unit length perpendicular to vectors $\vec{a} = (1, 1, 0)$ and $\vec{b} = (0, 1, 1)$ is :
(a) 3 (b) 2 (c) 1 (d) none of these
- The value of $(\hat{i} \times \hat{j}) \cdot \hat{k} + (\hat{i} \times \hat{j}) \cdot \hat{i}$ is equal to

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- (a)1 (b) -1 (c)0 (d) none of these

B. Fill in the blanks.

11. If $\vec{a} \times \vec{b} = \vec{u}$, express $(\vec{a}-\vec{b}) \times (\vec{a}+\vec{b})$ in terms of \vec{u} is equal to.....
12. If $(2\hat{i}+6\hat{j}+14\hat{k}) \times (2\hat{i} - \lambda\hat{j}+7\hat{k}) = \vec{0}$, then the value of λ is equal to
13. The vectors $\vec{a} = (3\hat{i}+2\hat{j}+9\hat{k})$ and $\vec{b} = (\hat{i}+p\hat{j}+3\hat{k})$ are parallel, then the value of p is.....
14. The value of $[\vec{a} + \vec{b}, \vec{b} + \vec{c}, \vec{c} + \vec{a}]$ is equal to.....
15. The value of $(\vec{a}-\vec{b}) \times (\vec{a}+\vec{b})$ is equal to
16. The expression for projection of \vec{a} on \vec{b} is equal to.....
17. If $\vec{a}, \vec{b}, \vec{c}$ are mutually perpendicular unit vectors, then the value of $|\vec{a} - \vec{b} + \vec{c}|$ is equal to.....
18. The angle between $4\hat{i}-2\hat{j}+4\hat{k}$ and $3\hat{i}-6\hat{j}-2\hat{k}$ is equal to.....
19. If $\vec{a}, \vec{b}, \vec{c}$ are the position vectors of three consecutive vertices of a parallelogram, then position vector of the fourth vertex is equal to.....
20. The sine of the angle between vectors $\vec{a} = 2\hat{i}-6\hat{j}-3\hat{k}$ and $\vec{b} = 4\hat{i}+3\hat{j}-\hat{k}$ is equal to.....

C. Answer the following

21. Find the value of a+b if the points A(2,a,3), B(3,-5,b) and C(-1,11,9) are collinear.
22. Find the value of $|\hat{i} \times (\hat{i} + \hat{j} + \hat{k})|$
23. Find the unit vectors along the resultant of vectors $\vec{a} = 2\hat{i}+3\hat{j}-5\hat{k}$ and $\vec{b} = \hat{i}-7\hat{j}+5\hat{k}$
24. If $\vec{a}, \vec{b}, \vec{c}$ be the position vectors of vertices of a triangle, then write the position vector of centroid of the triangle.
25. If position vectors of points P and Q are $2\hat{i}+3\hat{j}-7\hat{k}$ and $4\hat{i}-3\hat{j}-4\hat{k}$ respectively, then find the vector \vec{PQ} .
26. Find the angle between the vectors $3\hat{i}+2\hat{j}-6\hat{k}$ and $4\hat{i}-3\hat{j}+\hat{k}$
27. If \vec{a} and \vec{b} are mutually perpendicular unit vectors, write the value of $|\vec{a} + \vec{b}|$.
28. If \vec{a} and \vec{b} are perpendicular vectors, $|\vec{a} + \vec{b}| = 13$ and $|\vec{a}| = 5$, find the value of $|\vec{b}|$.
29. Write the value of $\vec{a} \cdot (\vec{a} \times \vec{b})$
30. If $\vec{a} + \vec{b} + \vec{c} = \vec{0}$, then find the magnitude of the vector $\vec{a} \times \vec{b} - \vec{c} \times \vec{a}$

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