

Q1. Find the magnitude of each of the following vectors :-

(i) $\vec{a} = \hat{i} + 2\hat{j} + 5\hat{k}$ (ii) $\vec{b} = 3\hat{i} + 4\hat{j} - 3\hat{k}$ (iii) $\vec{c} = \frac{1}{\sqrt{3}}\hat{i} - \frac{1}{\sqrt{3}}\hat{j} + \frac{1}{\sqrt{3}}\hat{k}$

Q2. Find the unit vector in the direction of :-

(i) $\vec{a} = \hat{i} + 3\hat{j} - 5\hat{k}$ (ii) direction of AB if A $(-2, 1, 2)$ & B $(2, -1)$

Q3. Find a vector in the direction of $\vec{a} = \hat{i} + 6\hat{j} - 2\hat{k} + 3\hat{k}$ whose magnitude is 4 units.

Q4. Find direction ratios and direction cosines of $\vec{a} = 5\hat{i} - 3\hat{j} + 4\hat{k}$

Q5. Find the angle between the vectors $\vec{a} = (3\hat{i} - 2\hat{j} + \hat{k})$ & $\vec{b} = \hat{i} - 2\hat{j} - 3\hat{k}$

Q6. Find x for which vectors $\vec{a} = 3\hat{i} + \hat{j} - 2\hat{k}$ & $\vec{b} = \hat{i} + \lambda\hat{j} - 3\hat{k}$ are perpendicular to each other.

Q7. Find the projection of $\vec{a} = 2\hat{i} - \hat{j} + \hat{k}$ on $\vec{b} = \hat{i} - 2\hat{j} + \hat{k}$

Q8. Find a vector with magnitude 3 units & is perpendicular to each of the vector $\vec{a} = 3\hat{i} + \hat{j} - 4\hat{k}$ and $\vec{b} = 6\hat{i} + 5\hat{j} - 2\hat{k}$

Q9. Find $(\vec{a} \times \vec{b})$ and $|\vec{a} \times \vec{b}|$ if (i) $\vec{a} = \hat{i} - \hat{j} + 2\hat{k}$ & $\vec{b} = 2\hat{i} + 3\hat{j} - 4\hat{k}$

(ii) $\vec{a} = 2\hat{i} + \hat{j} + 3\hat{k}$ & $\vec{b} = 3\hat{i} + 5\hat{j} - 2\hat{k}$ (iii) $\vec{a} = 3\hat{i} + 5\hat{j} - 2\hat{k}$ & $\vec{b} = 3\hat{i} + \hat{k}$

Q10. Find the area of parallelogram whose diagonal are (i) $\vec{d}_1 = 3\hat{i} + \hat{j} - 2\hat{k}$ & $\vec{d}_2 = \hat{i} - 3\hat{j} + 4\hat{k}$

(ii) $\vec{d}_1 = 2\hat{i} - \hat{j} + \hat{k}$ & $\vec{d}_2 = 3\hat{i} + 4\hat{j} - \hat{k}$

Q11. Using Vector find area of ΔABC if :-

(i) A $(3, -1, 2)$, B $(1, -1, -3)$ & C $(4, -3)$ (ii) A $(1, 2, 3)$, B $(2, 5, -1)$, C $(-1, 1, 2)$

Q12. Using vector show A, B, C are collinear pts.

(i) A $(3, -5, 1)$, B $(-1, -, 8)$ & C $(7, -10, -6)$ (ii) A $(6, -7, -1)$ B $(2, -3, 1)$ & C $(4, -5, 0)$

Q13. Verify $\vec{a} \times (\vec{b} + \vec{c}) = (\vec{a} \times \vec{b}) + (\vec{a} \times \vec{c})$ if

(i) $\vec{a} = \hat{i} - \hat{j} - 3\hat{k}$, $\vec{b} = 4\hat{i} - 3\hat{j} + \hat{k}$ and $\vec{c} = 2\hat{i} - \hat{j} + 2\hat{k}$

(ii) $\vec{a} = 4\hat{i} - \hat{j} - \hat{k}$, $\vec{b} = \hat{i} - \hat{j} + \hat{k}$ and $\vec{c} = 2\hat{i} - \hat{j} + 2\hat{k}$

Q14. If $|\vec{a}| = 5$, $|\vec{b}| = 13$, and $(\vec{a} \times \vec{b}) = 25$, find $\vec{a}$, $\vec{b}$

Q15. If $|\vec{a}| = 2$, $|\vec{b}| = 7$, and $(\vec{a} \times \vec{b}) = 3\hat{i} + 2\hat{j} + 6\hat{k}$, find the angle between $\vec{a}$ and $\vec{b}$.