

# CBSE question paper

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1. If  $\vec{a}, \vec{b}, \vec{c}$  are position vectors of the points A(2,3,-4), B(3,-4,-5) and C(3,2,-3) respectively, then  $|\vec{a} + \vec{b} + \vec{c}|$  is equal to
  - (a)  $\sqrt{113}$
  - (b)  $\sqrt{185}$
  - (c)  $\sqrt{203}$
  - (d)  $\sqrt{209}$
2. Find the distance of the point (a,b,c) from the x-axis
3. If  $\vec{a} = 2\hat{i} - \hat{j} + 2\hat{k}$  and  $\vec{b} = 5\hat{i} - 3\hat{j} - 4\hat{k}$ , then find the ratio  $\frac{\text{projection of vector } \vec{a} \text{ on } \vec{b}}{\text{projection of vector } \vec{b} \text{ on vector } \vec{a}}$

OR

Let  $\hat{a}$  and  $\hat{b}$  be two unit vectors. If the vectors  $\vec{c} = \hat{a} + 2\hat{b}$  and  $\vec{d} = 5\hat{a} - 4\hat{b}$  are perpendicular to each other, then find the angle between the vectors  $\hat{a}$  and  $\hat{b}$ .

4. Show that  $|\vec{a}|\vec{b} + |\vec{b}|\vec{a}$  is perpendicular to  $|\vec{a}\vec{b}| - |\vec{b}|\vec{a}$ , for any two non-zero vectors  $\vec{a}$  and  $\vec{b}$ .
5. Prove that three points A,B and C with position vectors  $\vec{a}, \vec{b}$  and  $\vec{c}$  respectively are collinear if and only if  $(\vec{b} \times \vec{c}) + (\vec{c} \times \vec{a}) + (\vec{a} \times \vec{b}) = \vec{0}$ .