

## Worksheet: Vector Algebra

CBSE · Class 12 · Mathematics · 8 questions · 35 marks

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Score: \_\_\_\_\_ / 35

**Q1.** Classify time period, distance, and force as scalar or vector quantities. *[2 marks]*

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**Q2.** Find the unit vector in the direction of  $\mathbf{a} = \mathbf{i} + \mathbf{j} + 2\mathbf{k}$ . *[3 marks]*

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**Q3.** Find the position vector of the midpoint of the vector joining  $P(2,3,4)$  and  $Q(4,1,-2)$ . *[4 marks]*

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**Q4.** Find the projection of the vector  $\mathbf{i} - \mathbf{j}$  on the vector  $\mathbf{i} + \mathbf{j}$ . *[4 marks]*

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**Q5.** Find the area of the triangle with vertices  $A(1,1,2)$ ,  $B(2,3,5)$ ,  $C(1,5,5)$ . *[5 marks]*

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**Q6.** If  $\mathbf{a}$ ,  $\mathbf{b}$ ,  $\mathbf{c}$  are unit vectors such that  $\mathbf{a} + \mathbf{b} + \mathbf{c} = \mathbf{0}$ , find  $\mathbf{a} \cdot \mathbf{b} + \mathbf{b} \cdot \mathbf{c} + \mathbf{c} \cdot \mathbf{a}$ . *[5 marks]*

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**Q7.** Show that  $(\mathbf{a}-\mathbf{b}) \times (\mathbf{a}+\mathbf{b})=2(\mathbf{a} \times \mathbf{b})$ . [6 marks]

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**Q8.** Find the position vector of R which divides PQ (position vectors  $\mathbf{i}+2\mathbf{j}-\mathbf{k}$  and  $-\mathbf{i}+\mathbf{j}+\mathbf{k}$ ) externally in the ratio 2:1. [6 marks]

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