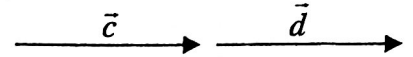
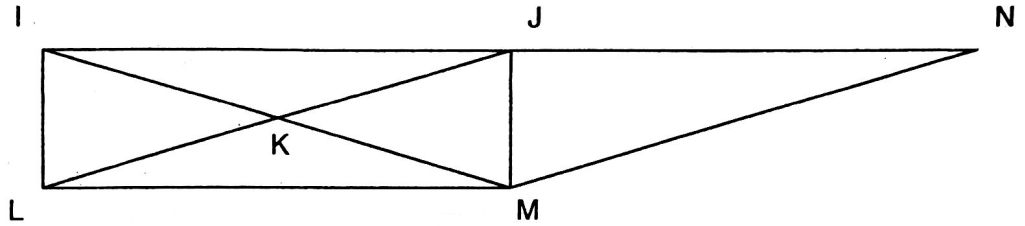


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1. Is distance a scalar or a vector? [C1] 2. Draw a vector representing 80km/h NW and include a scale. [C1] 3. Classify the vectors as equal, opposite, parallel, or none of these. [C1]



4. Using the diagram below,



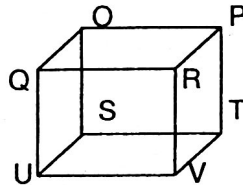
- a) state a vector equal to  $\vec{JM}$ . [K1]

- b) simplify the following into one vector. [K4]

i)  $\vec{LI} + \vec{JK}$

ii)  $\vec{JN} - \vec{IK}$

5. In the cube below, if  $\vec{a} = \vec{OP}$ ,  $\vec{b} = \vec{OQ}$ ,  $\vec{c} = \vec{OS}$ , express each vector in terms of  $\vec{a}, \vec{b}, \vec{c}$ . [A2]

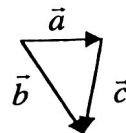


- a)  $\vec{UT}$

- b)  $\vec{SR}$

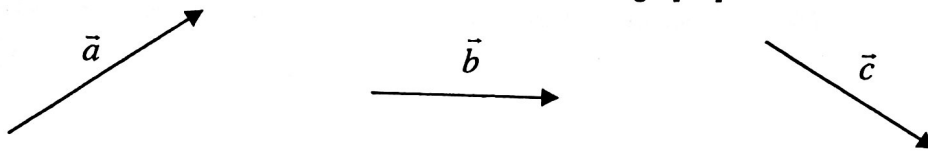
6. Simplify  $\vec{MN} + \vec{PQ} - \vec{PN}$  into a single vector. [A2]

7. Express the shortest vector as the sum or difference of two other vectors. [A1]



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8. Using the given vectors, draw and label each of the following. [K5]



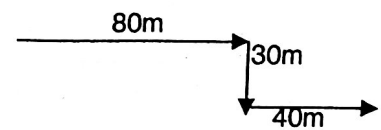
a)  $\vec{a} - \vec{b}$

b)  $\vec{a} + 2\vec{b} + \frac{1}{2}\vec{c}$

c) a unit vector for  $\vec{c}$

9. If  $|\vec{c}| = 4\text{cm}$ ,  $|\vec{d}| = 2\text{cm}$  and  $\vec{c} \angle \vec{d} = 30^\circ$  determine the magnitude of  $\vec{c} - 2\vec{d}$ . [K2]

10. Determine the displacement. [K2] Note: also determine the angle  $\theta$ .



11. Given points A(-1,2) and B(1,6) determine the location of C if  $\vec{AC} = -\frac{1}{2}\vec{AB}$  [T2]

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12. Determine the resultant velocity of a boat sailing at 10km/h at a bearing of  $140^\circ$  and encountering a 2km/h current from a bearing of  $30^\circ$ . Include a diagram. [A4C1]

13. A 90kg person hangs with arms at  $80^\circ$  angles to a bar. What is the force of tension in each arm? Include a diagram. [A2C1]

14. A 1000kg car goes down a driveway inclined at  $5^\circ$ . Determine the forces along and into the driveway. Include a diagram. [A3C1]

15. Eva wants to cross a river with a 4km/h current and arrive at a spot 3km downstream. If the river is 600m wide, determine Eva's heading if her boat can travel 12km/h in still water. Include a diagram. [T4] *Note: current is also moving downstream.*