

VECTORS (Q 2, PAPER 2)

LESSON NO. 2: i, j VECTORS

2006

2 (a) $\vec{x} = -3\vec{i} + \vec{j}$. Express $(\vec{x}^\perp)^\perp$ in terms of \vec{i} and \vec{j} .

2005

2 (b) $\vec{p} = 3\vec{i} + 4\vec{j}$. \vec{q} is the unit vector in the direction of \vec{p} .

(i) Express \vec{q} and \vec{q}^\perp in terms of \vec{i} and \vec{j} .

(ii) Express $11\vec{i} - 2\vec{j}$ in the form $k\vec{q} + l\vec{q}^\perp$, where $k, l \in \mathbf{R}$.

2004

2 (a) $\vec{r} = 12\vec{i} - 35\vec{j}$. Find the unit vector in the direction of \vec{r} .

2003

2 (a) $oabc$ is a parallelogram where o is the origin, $\vec{a} = 3\vec{i} - \vec{j}$ and $\vec{b} = 4\vec{i} + 3\vec{j}$. Express \vec{c} in terms of \vec{i} and \vec{j} .

2002

2 (a) $\vec{s} = 4\vec{i} - 3\vec{j}$ and $\vec{t} = 2\vec{i} - 5\vec{j}$. Find $|\overline{st}|$.

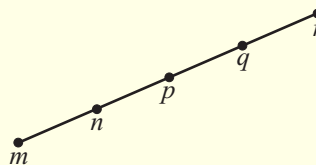
2001

2 (b) $[mr]$ is divided into four line segments of equal length by the points n, p and q .

Given that $\vec{m} = -2\vec{i} + 3\vec{j}$ and $\vec{q} = 7\vec{i} - 9\vec{j}$, express

(i) \vec{p} in terms of \vec{i} and \vec{j} .

(ii) \vec{r} in terms of \vec{i} and \vec{j} .



ANSWERS

2006 2 (a) $3\vec{i} - \vec{j}$

2005 2 (b) (i) $\vec{q} = \frac{3}{5}\vec{i} + \frac{4}{5}\vec{j}$, $\vec{q}^\perp = -\frac{4}{5}\vec{i} + \frac{3}{5}\vec{j}$ (ii) $5\vec{q} - 10\vec{q}^\perp$

2004 2 (a) $\frac{12}{37}\vec{i} - \frac{35}{37}\vec{j}$

2003 2 (a) $\vec{c} = \vec{i} + 4\vec{j}$

2002 2 (a) $\sqrt{8}$

2001 2 (b) (i) $\vec{p} = 4\vec{i} - 5\vec{j}$ (ii) $\vec{r} = 10\vec{i} - 13\vec{j}$