

VECTORS (Q 2, PAPER 2)

2008

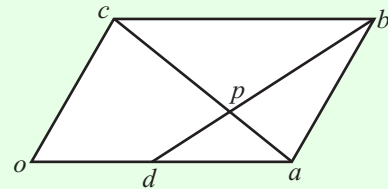
2 (a) Given that $|10\vec{i} + k\vec{j}| = |11\vec{i} - 2\vec{j}|$, find the two possible values of $k \in \mathbf{R}$.

(b) $\vec{x} = -\vec{i} + 3\vec{j}$, $\vec{y} = 4\vec{i} - 2\vec{j}$ and $\vec{z} = \vec{x} - t\vec{y}$, where $t \in \mathbf{R}$.

(i) Given that $\vec{x} \perp \vec{z}$, calculate the value of t .

(ii) Find the measure of $\angle xoy$, where o is the origin.

(c) $oabc$ is a parallelogram, where o is the origin.
 d is the midpoint of $[oa]$ and $[db]$ cuts the diagonal $[ac]$ at p .



(i) Given that $\vec{ap} = k\vec{ac}$, where $k \in \mathbf{R}$,
express \vec{p} in terms of \vec{a} , \vec{c} and k .

(ii) Given that $\vec{bp} = l\vec{bd}$, where $l \in \mathbf{R}$, express \vec{p} in terms of \vec{a} , \vec{c} and l .

(iii) Hence find the value of k and the value of l .

ANSWERS

2 (a) $k = \pm 5$

(b) (i) $t = -1$ (ii) 135°

(c) (i) $\vec{p} = (1-k)\vec{a} + k\vec{c}$

(ii) $\vec{p} = (1-\frac{1}{2}l)\vec{a} + (1-l)\vec{c}$

(iii) $k = \frac{1}{3}, l = \frac{2}{3}$