

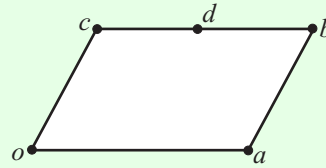
VECTORS (Q 2, PAPER 2)

2001

2 (a) $oabc$ is a parallelogram where o is the origin. d is the midpoint of $[cb]$.

(i) Express \vec{b} in terms of \vec{a} and \vec{c} .

(ii) Express \vec{d} in terms of \vec{a} and \vec{c} .

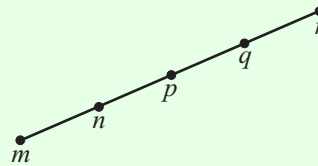


2 (b) $[mr]$ is divided into four line segments of equal length by the points n , p and q .

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} .



2 (c) rst is a triangle where $\vec{r} = -\vec{i} + 2\vec{j}$, $\vec{s} = -4\vec{i} - 2\vec{j}$ and $\vec{t} = 3\vec{i} - \vec{j}$.

(i) Express \vec{rs} , \vec{st} and \vec{tr} in terms of \vec{i} and \vec{j} .

(ii) Show that the triangle rst is right-angled at r .

(iii) Find the measure of $\angle rst$.

ANSWERS

2 (a) (i) $\vec{b} = \vec{a} + \vec{c}$ (ii) $\vec{d} = \frac{1}{2}\vec{a} + \vec{c}$

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

2 (c) (i) $\vec{rs} = -3\vec{i} - 4\vec{j}$, $\vec{st} = 7\vec{i} + \vec{j}$, $\vec{tr} = -4\vec{i} + 3\vec{j}$ (iii) 45°