VECTORS I
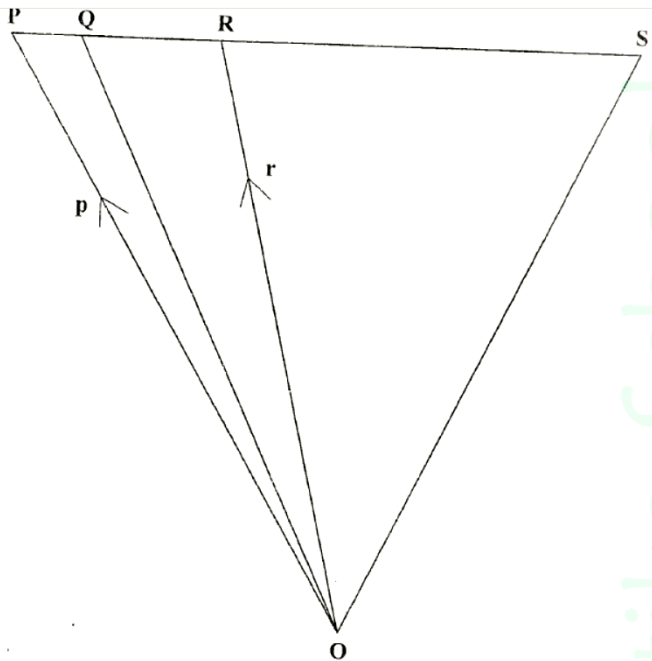
Given that position vectors of points A and B are $a = \begin{pmatrix} -3 \\ 2 \end{pmatrix}$ and $b = \begin{pmatrix} 2 \\ 5 \end{pmatrix}$ and C is a point

on AB such that AC : CB = 1 : 2. Find the coordinates of the point C.   (3mks)

Given that $b = \begin{pmatrix} 2 \\ 4 \end{pmatrix}$, $c = \begin{pmatrix} 3 \\ 2 \end{pmatrix}$ and $a = 3c - 2b$, find the magnitude of a, correct to 2 decimal places.

In the figure below OP = p, OR = r, PQ:QR = 1:2 and PS = 3PR.

Express QS in terms of p and r.

Given that $\mathbf{OA} = \begin{pmatrix} 2 \\ 3 \end{pmatrix}$ and $\mathbf{OB} = \begin{pmatrix} -4 \\ 5 \end{pmatrix}$. Find the mid point M of $\mathbf{AB}$.

The position vectors of points P, Q and R are $\mathbf{OP} = \begin{pmatrix} -3 \\ 6 \end{pmatrix}$, $\mathbf{OQ} = \begin{pmatrix} 2 \\ 1 \end{pmatrix}$, $\mathbf{OR} = \begin{pmatrix} 4 \\ -1 \end{pmatrix}$. Show that P, Q and R are collinear.

In the diagram below, the coordinates of points A and B are (1,6) and (15, 6) respectively.
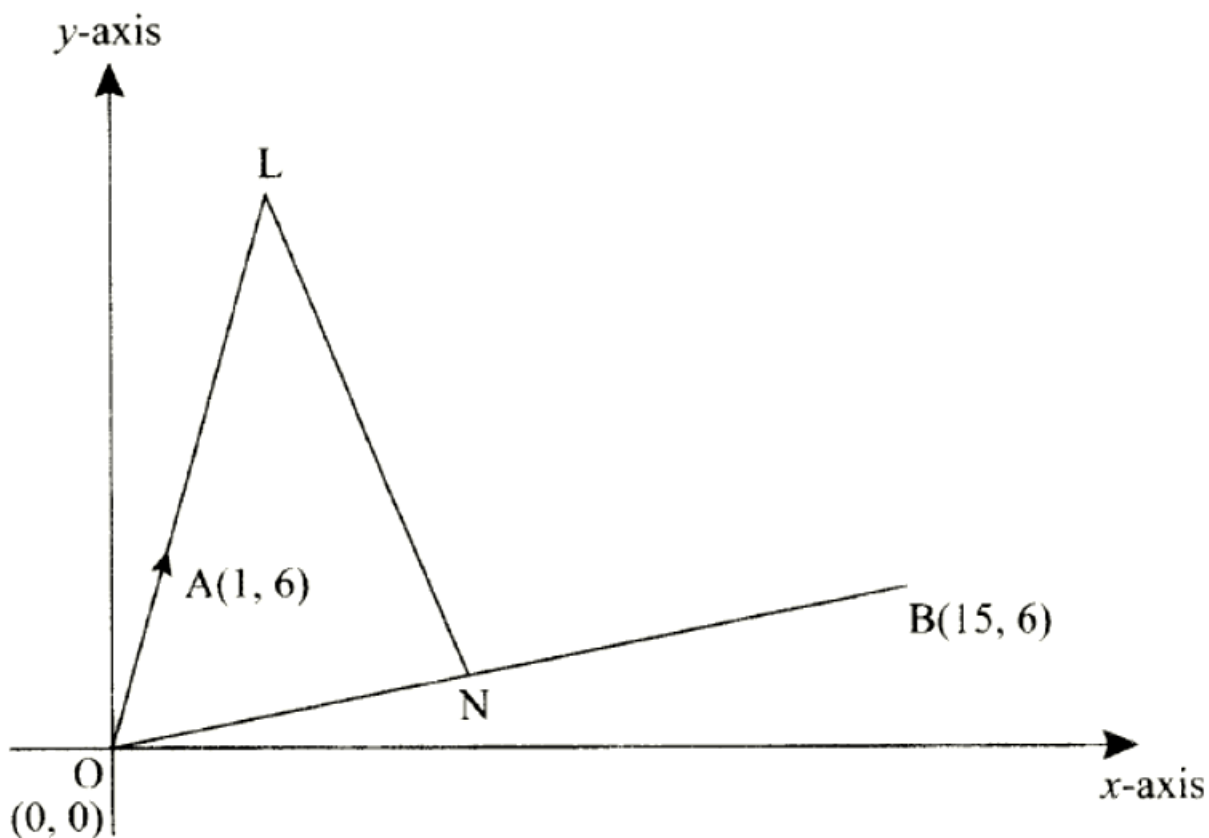
Point N is on OB and that 30N = 2OB. Line OA is produced to L such that OL = 3OA.

a)Find vector LN

b) Given that a point M is on LN such that LM: MN = 3: 4 find the coordinate of M

c) If line OM is produced to T such a that OM: MT= 6:1

i)Find the position vector of T

ii) Show that points L, T and B are collinear

The position vectors of points F, G, and H are f, g, and h respectively. Point H divides FG in the ratio 4:-1. Express h in terms of f and g