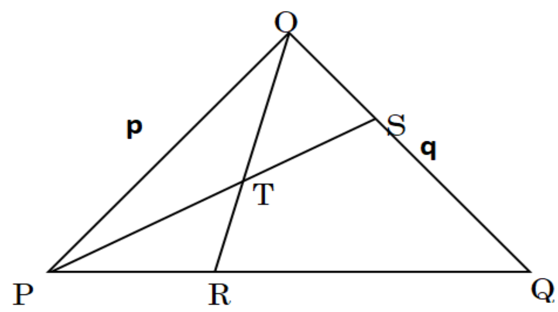
VECTORS II

REVISION KIT

In the triangle OPQ below, OP = **p** and OQ = **q**. R is a point on PQ such that PR: RQ = 1 : 3 and 5OS = 2 OQ. PS intersects OR at T.

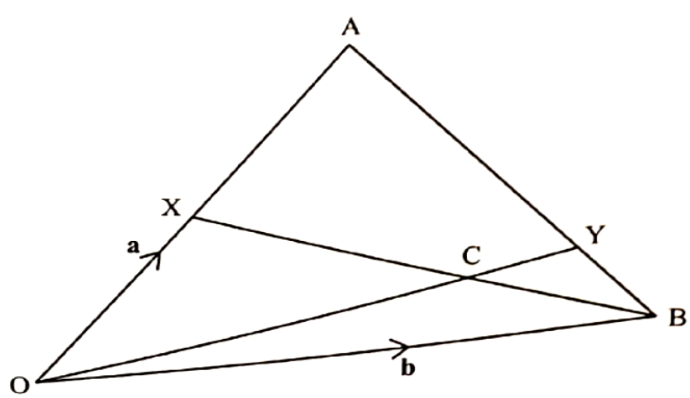


(a) Express in term of **p** and **q**

(i) OS (1mark)
(ii) PQ (1mark)
(iii) OR (2mark)

(b)Given that **OT**= h**OR** and **PT** = k**PS**. Determine the values of h and k. (6marks)

In the figure below, OA = a, OB = b and BX meets OY at C. OX:OA = 1:2 and BY:YA = 1:3.



(a) Express in terms of a and b:

(ii) OY;

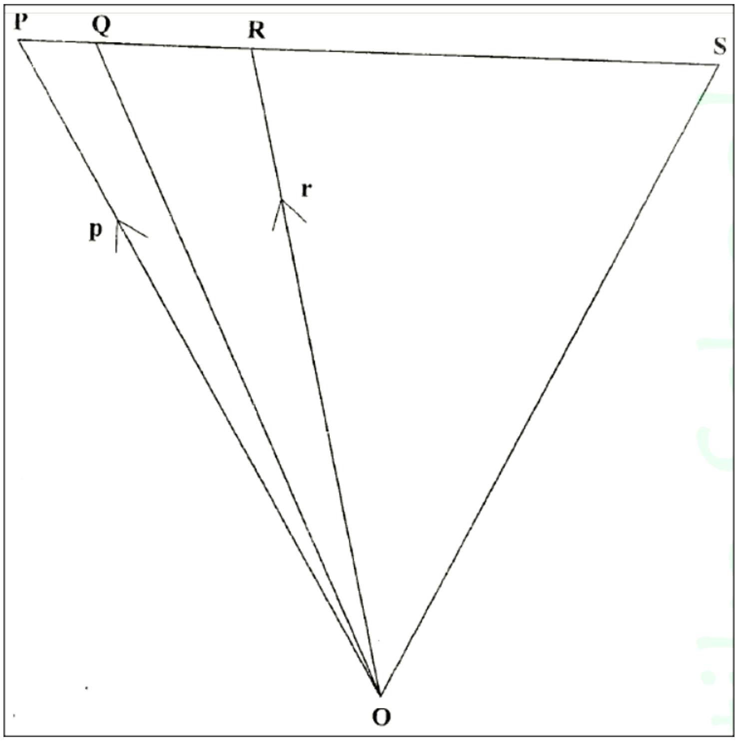
(iii) BX.

(b) Given that OC = hOY and BC = kBX, determine the values of h and k.

The position vectors of points A, B and C are $\mathbf{OA} = \begin{pmatrix} -3 \\ 4 \end{pmatrix}$, $\mathbf{OB} = \begin{pmatrix} 1 \\ 2 \end{pmatrix}$ and $\mathbf{OC} = \begin{pmatrix} 7 \\ -1 \end{pmatrix}$.

Show that A, B and C are collinear.

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



Express QS in terms of p and r.

The points P, Q, R and S have position vectors 2p, 3p, r and 3r respectively, relative to an origin O. A point T divides PS internally in the ratio 1:6

(a) Find, in the simplest form, the vectors OT and QT in terms P and r (4 marks)

(b)

(i) Show that the points Q, T, and R lie on a straight line (3 marks)

(ii) Determine the ratio in which T divides QR (1 mark)

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