



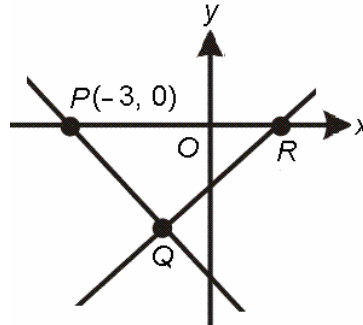
## CHAPTER 6: COORDINATE GEOMETRY



### Paper 1

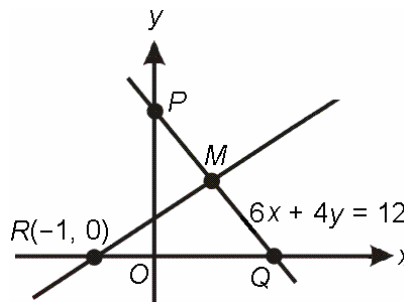
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1. The diagram shows the straight line  $PQ$  which is perpendicular to the straight line  $QR$ .



The equation of the straight line  $QR$  is  $y = x - 2$ . Find the coordinates of point  $Q$ .

2. Given that the equation of the straight line  $AB$  is  $py = qx + p$  and the equation of the straight line  $CD$  is  $(p + q)y = x + q$ . If  $AB$  is perpendicular to  $CD$ , express  $q$  in terms of  $p$ .
3. The straight line  $4y + 3x = 12$  intersects the  $x$ -axis at point  $P$  and the  $y$ -axis at point  $Q$ . Find  
(a) the coordinates of points  $P$  and  $Q$ . (b) the distance of  $PQ$ .
4. Given  $B(5, k)$  is a point on the line joining point  $A(3, 4)$  and point  $C(8, 12)$  such that  $AB : BC = m : n$ . Find  
(a)  $m : n$ . (b) the value of  $k$ .
5. A point  $S$  moves in such a way that the ratio of its distance from  $P(2, 3)$  to its distance from  $Q(-4, 6)$  is always  $1 : 2$ .  
(a) Find the equation of the locus of  $S$ .  
(b) Determine if the point  $R(1, -2)$  lies on the locus or not.
6. The diagram shows a straight line  $PQ$  with the equation  $6x + 4y = 12$ .  $M$  is the midpoint of  $PQ$ .



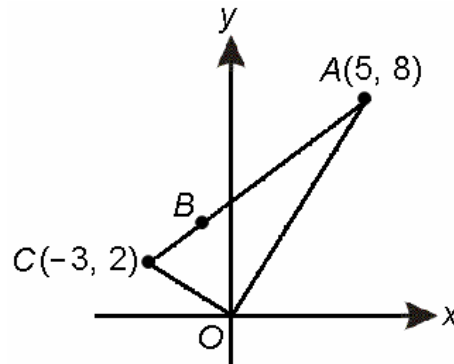
Find

- (a) the coordinates of  $M$ . (b) the equation of  $MR$ .

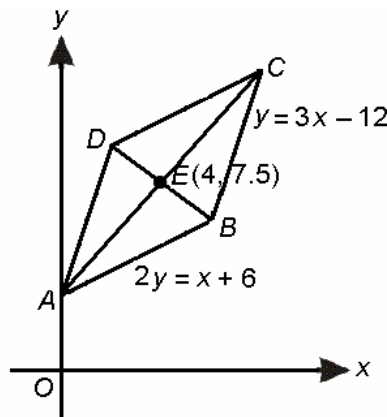
 **Paper 2**

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1. The diagram shows the triangle  $OAC$  where  $O$  is the origin. Point  $B$  lies on the straight line  $AC$ .



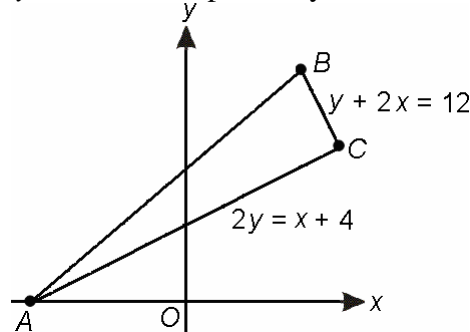
- (a) Calculate the area, in unit<sup>2</sup>, of triangle  $OAC$ .
  - (b) Given  $AB : BC = 1 : 3$ , find the coordinates of  $B$ .
  - (c) A point  $P$  moves such that its distance from point  $C$  is always twice its distance from point  $A$ .
    - (i) Find the equation of the locus of  $P$ .
    - (ii) Hence, determine whether or not this locus intersects the  $y$ -axis.
2. The diagram shows a parallelogram  $ABCD$ , where  $A$  lies on the  $y$ -axis. The equation of  $AB$  and  $BC$  are  $2y = x + 6$  and  $y = 3x - 12$  respectively. Given the diagonals of the parallelogram intersect at the point  $E(4, 7.5)$ . The line  $BD$  produced intersects the  $y$ -axis at point  $F$ .



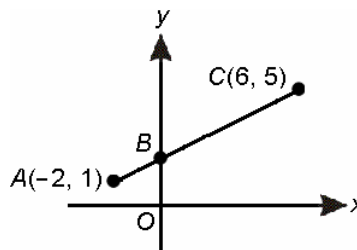
Find

- (a) the coordinates of points  $B$ ,  $C$  and  $D$ .
- (b) the area of parallelogram  $ABCD$ .
- (c) the coordinates of point  $F$ .

3. The diagram shows a triangle  $ABC$  with an area of  $10 \text{ unit}^2$ . The equations of  $AC$  and  $BC$  are  $2y = x + 4$  and  $y + 2x = 12$  respectively. Point  $A$  lies on the  $x$ -axis.



- Show that  $AC$  is perpendicular to  $BC$ .
  - Find the coordinates of points  $A$ ,  $B$  and  $C$ .
  - Find the perpendicular distance of  $C$  from the line  $AB$ .
4. In the diagram,  $ABC$  is a straight line and point  $B$  divides  $AC$  internally in the ratio  $AB : BC = m : n$ .



Find

- the equation of the line  $AC$ .
  - the coordinates of point  $B$ .
  - the ratio  $m : n$ .
  - the equation of the straight line passing through  $B$  and perpendicular to  $AC$ .
5. A point  $P$  moves such that it is equidistant from the  $y$ -axis and point  $A(2, 0)$ .
- Show that the equation of the locus of  $P$  is  $y^2 = 4x - 4$ .
  - Show that point  $B(5, 4)$  lies on the locus of  $P$ .
  - The line joining  $A$  and  $B$  meets the locus of  $P$  again at point  $C$ . Find
    - the coordinates of point  $C$ .
    - the area of triangle  $OBC$ , where  $O$  is the origin.
6. Given  $A(-3, -2)$ ,  $B(1, 4)$  and  $C(3, 7)$  are three points in a Cartesian plane.
- Show that  $A$ ,  $B$  and  $C$  are collinear.
  - If  $B$  divides the line  $AC$  in the ratio  $m : n$ , find this ratio.
  - Find the equation of the line that passes through point  $B$  and is perpendicular to  $AC$ .
  - The line in (c) intersects the  $x$ -axis at point  $E$  and the  $y$ -axis at point  $F$ .
    - Find the coordinates of points  $E$  and  $F$ .
    - Hence, calculate the area of triangle  $AEF$ .