

Section 1: Straight lines

Exercise

- (a) For the points A(3, 1) and B(7, 4) calculate

 - the gradient of AB
 - the gradient of a line perpendicular to AB
 - the midpoint of AB
 - the distance AB
 - the coordinates of the point C which divides AB in the ratio 3:2.

(b) Repeat part (a) for the points A(-2, 9) and B(3, -1).
- For the points P(2, -1) and Q(-4, 8), find

 - the midpoint M of PQ
 - the coordinates of the point R such that PR:QR is 1:3
 - the coordinates of the point S such that PS:QS is 7:3.
- Given the points A(3, 1), B(6, y) and C(12, -2) find the value(s) of y for which

 - the line AB has gradient 2
 - the distance AB is 5
 - A, B and C are collinear
 - AB is perpendicular to BC
 - the lengths AB and BC are equal
- P is the point (2, 1), Q is (6, 9) and R is (10, 2).

 - Sketch the triangle PQR.
 - Prove that triangle PQR is isosceles.
 - Work out the area of triangle ABC.
- The point E is (2, -1), F is (1, 3), G is (3, 5) and H is (4, 1).
Show, by calculation, that EFGH is a parallelogram.
- Find the equations of the following lines.

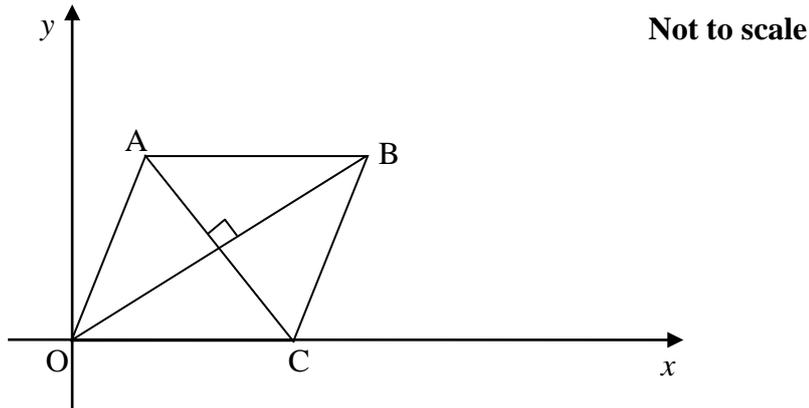
 - parallel to $y = 4x - 1$ and passing through (2, 3)
 - perpendicular to $y = 2x + 7$ and passing through (1, 2)
 - parallel to $3y + x = 10$ and passing through (4, -1)
 - perpendicular to $3x + 4y = 12$ and passing through (-3, 0)
 - parallel to $x + 5y + 8 = 0$ and passing through (-1, -6)
- Find the equation of the perpendicular bisector of AB in each of the following cases.

(i) A(1, 6), B(3, 2)	(ii) A(8, -1), B(-2, 3)
(iii) A(-5, 2), B(7, -4)	(iv) A(-3, -5), B(5, 1)
- A triangle has vertices E(2, 5), F(4, 1) and G(-2, -3).

 - Find the midpoint of each side and hence find the equations of the three medians.
(Medians are the lines from the midpoint of each side to the opposite vertex).
 - Show that the point $(\frac{4}{3}, 1)$ lies on each median.

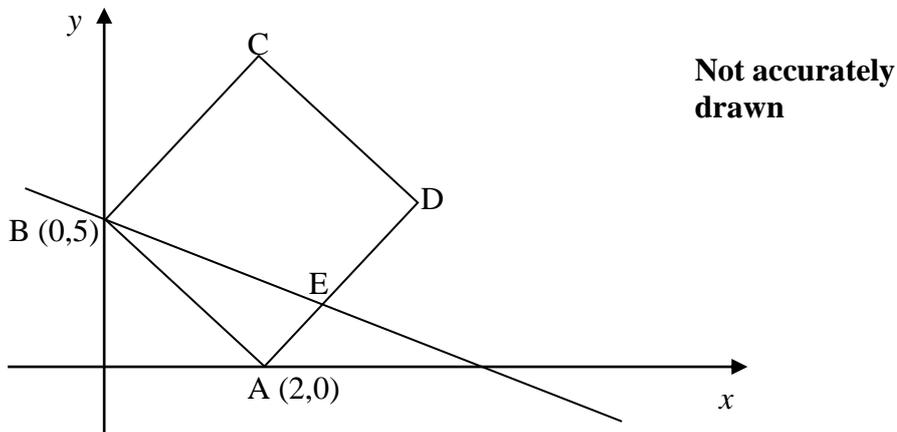
AQA FM Coordinate geometry 1 Exercise

9. ABCD is a parallelogram. The equation of AB is $y = 4x - 3$ and the equation of BC is $y = 2x + 1$.
- Find the coordinates of B.
 - The coordinates of A are (3, 9). Find the equation of AD.
 - The coordinates of C are (7, 15). Find the equation of CD.
 - Find the coordinates of D.
10. The diagram shows a rhombus OABD. O is the origin. B is the point with coordinates (6, 4). D lies on the x -axis.



Find the coordinates of point A.

11. ABCD is a square. Point E cuts AD in the ratio 1:2.



Find the coordinates of the point where line BE crosses the x -axis.