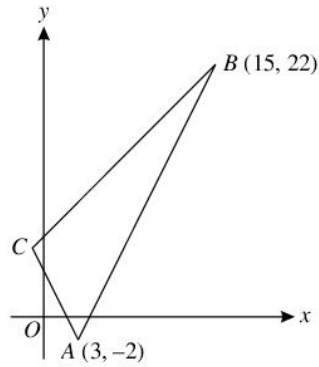


Q1.

8



The diagram shows a triangle ABC in which A is $(3, -2)$ and B is $(15, 22)$. The gradients of AB , AC and BC are $2m$, $-2m$ and m respectively, where m is a positive constant.

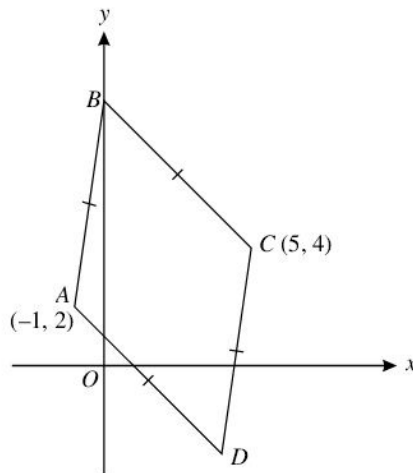
- (i) Find the gradient of AB and deduce the value of m . [2]
- (ii) Find the coordinates of C . [4]

The perpendicular bisector of AB meets BC at D .

- (iii) Find the coordinates of D . [4]

Q2.

8



The diagram shows a rhombus $ABCD$ in which the point A is $(-1, 2)$, the point C is $(5, 4)$ and the point B lies on the y -axis. Find

- (i) the equation of the perpendicular bisector of AC , [3]
- (ii) the coordinates of B and D , [3]
- (iii) the area of the rhombus. [3]

Q3.

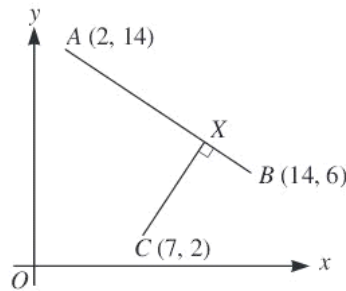
- 3 The line $\frac{x}{a} + \frac{y}{b} = 1$, where a and b are positive constants, meets the x -axis at P and the y -axis at Q . Given that $PQ = \sqrt{45}$ and that the gradient of the line PQ is $-\frac{1}{2}$, find the values of a and b . [5]

Q4.

- 9 The coordinates of A are $(-3, 2)$ and the coordinates of C are $(5, 6)$. The mid-point of AC is M and the perpendicular bisector of AC cuts the x -axis at B .
- (i) Find the equation of MB and the coordinates of B . [5]
 - (ii) Show that AB is perpendicular to BC . [2]
 - (iii) Given that $ABCD$ is a square, find the coordinates of D and the length of AD . [2]

Q5.

7



The diagram shows three points $A(2, 14)$, $B(14, 6)$ and $C(7, 2)$. The point X lies on AB , and CX is perpendicular to AB . Find, by calculation,

- (i) the coordinates of X , [6]
- (ii) the ratio $AX : XB$. [2]

Q6.

- 2 Points A, B and C have coordinates $(2, 5)$, $(5, -1)$ and $(8, 6)$ respectively.
- (i) Find the coordinates of the mid-point of AB . [1]
 - (ii) Find the equation of the line through C perpendicular to AB . Give your answer in the form $ax + by + c = 0$. [3]

Q7.

- 7 The point A has coordinates $(-1, 6)$ and the point B has coordinates $(7, 2)$.
- (i) Find the equation of the perpendicular bisector of AB , giving your answer in the form $y = mx + c$. [4]
- (ii) A point C on the perpendicular bisector has coordinates (p, q) . The distance OC is 2 units, where O is the origin. Write down two equations involving p and q and hence find the coordinates of the possible positions of C . [5]

Q8.

- 3 The point A has coordinates $(3, 1)$ and the point B has coordinates $(-21, 11)$. The point C is the mid-point of AB .
- (i) Find the equation of the line through A that is perpendicular to $y = 2x - 7$. [2]
- (ii) Find the distance AC . [3]