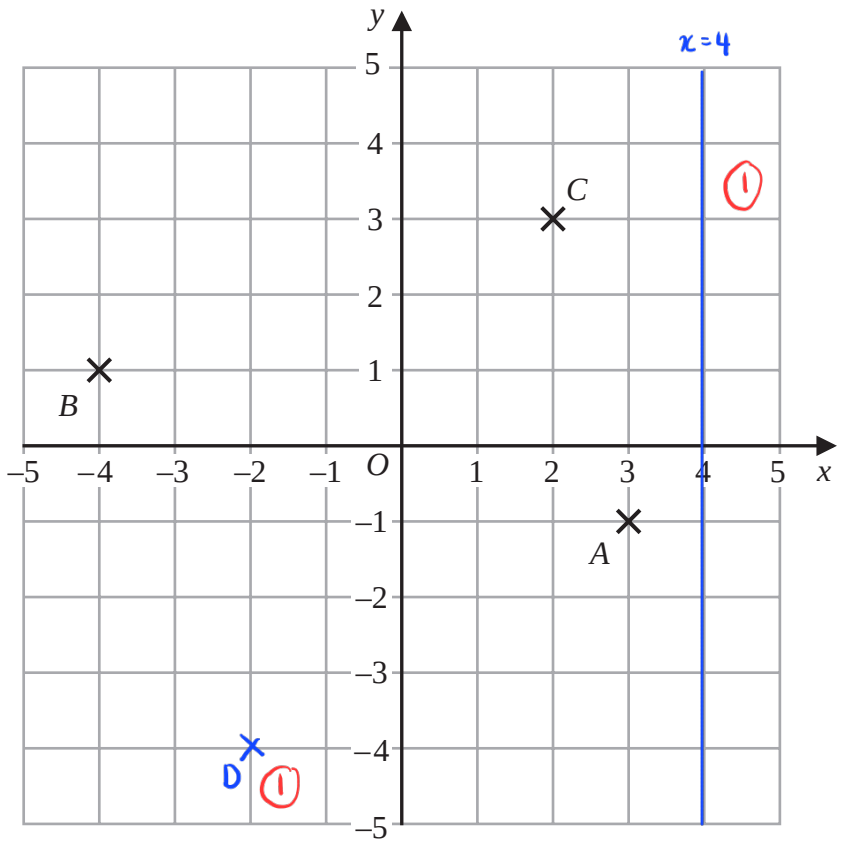
1 The diagram shows three points, *A*, *B* and *C*, marked on a grid.



(a) Write down the coordinates of point *A*.

(3 , −1)

(1)

The coordinates of the point *D* are (–2, –4)

(b) On the grid, mark with a cross (×) the position of *D*.
Label the cross *D*.

(1)

(c) Find the coordinates of the midpoint of *BC*.

B(−4, 1) C(2, 3)

midpoint BC = $\left(\frac{-4+2}{2}, \frac{1+3}{2}\right)$

= (−1, 2)

(−1 , 2)

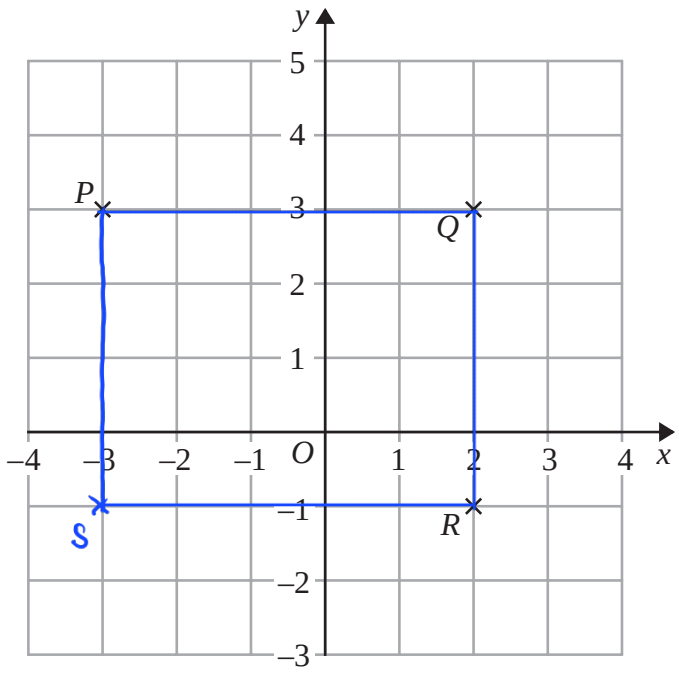
(2)

(d) On the grid, draw the line with equation $x = 4$

(1)

(Total for Question 1 is 5 marks)

2 *P*, *Q* and *R* are three points marked on a grid.



(a) Write down the coordinates of point *Q*.

(2 , 3) (1)

S is the point such that *PQRS* is a rectangle.

(b) Find the coordinates of point *S*.

(-3 , -1) (1)

(c) Find the coordinates of the midpoint of *PR*.

P(-3, 3) , R(2, -1)

midpoint PR = $\left(\frac{-3+2}{2}, \frac{3+(-1)}{2}\right)$ (1)

= (-0.5, 1)

(-0.5 , 1) (2)

(Total for Question 2 is 4 marks)

3 The point A has coordinates $(5, -4)$
The point B has coordinates $(13, 1)$

(a) Work out the coordinates of the midpoint of AB.

midpoint AB : $\left(\frac{5+13}{2}, \frac{-4+1}{2}\right)$ (1)

$= (9, -1.5)$ (1)

(9 , -1.5)

(2)

Line **L** has equation $y = 2 - 3x$

(b) Write down the gradient of line **L**.

$y = -3x + 2$
$\uparrow m$

-3 (1)

(1)

Line **L** has equation $y = 2 - 3x$

(c) Does the point with coordinates $(100, -302)$ lie on line **L**?
You must give a reason for your answer.

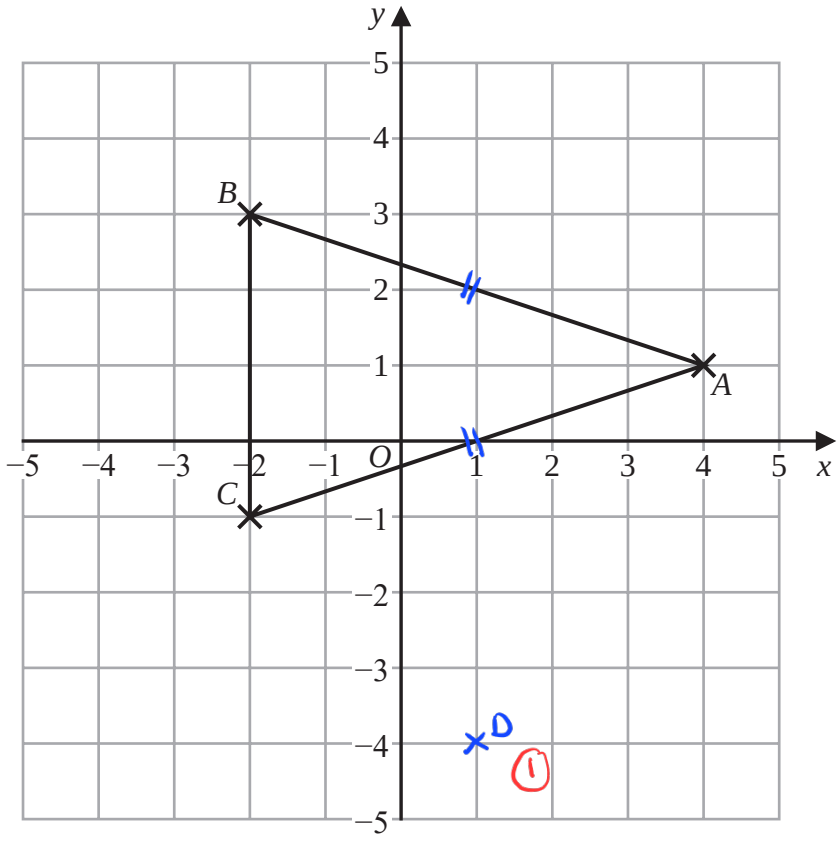
$y + 3x = 2$

LHS : $-302 + 3(100) = -2$. No. The coordinate does not lie on line L. (1)

(1)

(Total for Question 3 is 4 marks)

4 The points *A*, *B* and *C*, shown on the grid, are the vertices of triangle *ABC*.



(a) Write down the coordinates of the point *B*.

(..... -2 ....., ... 3 .....) (1)

(b) Write down the mathematical name of triangle *ABC*.

..... isosceles ..... (1)

The coordinates of point *D* are (1, −4)

(c) On the grid, mark with a cross (×) the position of *D*.
Label the point *D*.

(1)

(d) Find the coordinates of the midpoint of *AB*.

A (4, 1) B (−2, 3)

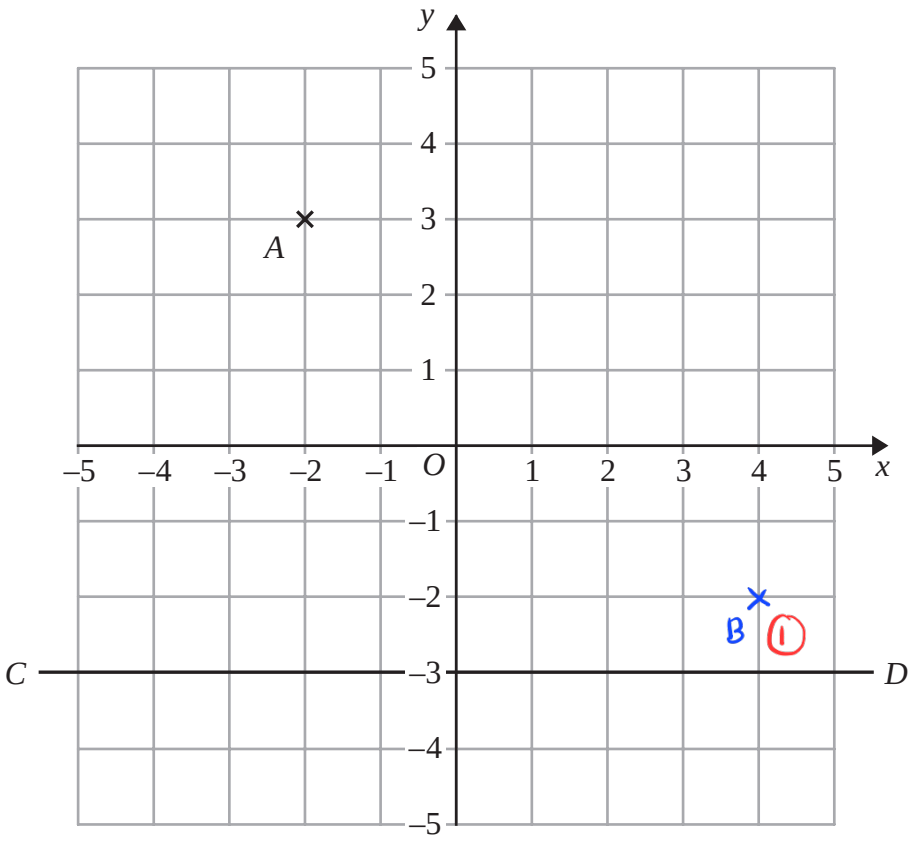
midpoint AB : $\left(\frac{4+(-2)}{2}, \frac{1+3}{2}\right)$

: (1, 2)

(..... 1 ....., ... 2 .....) (2)

(Total for Question 4 is 5 marks)

5 The diagram shows the point A and the line CD on a grid.



(a) Write down the coordinates of point A.

(-2 , 3) (1)

(1)

The point B has coordinates $(4, -2)$

(b) On the grid, mark with a cross (×) the point B.
Label the point B.

(1)

(1)

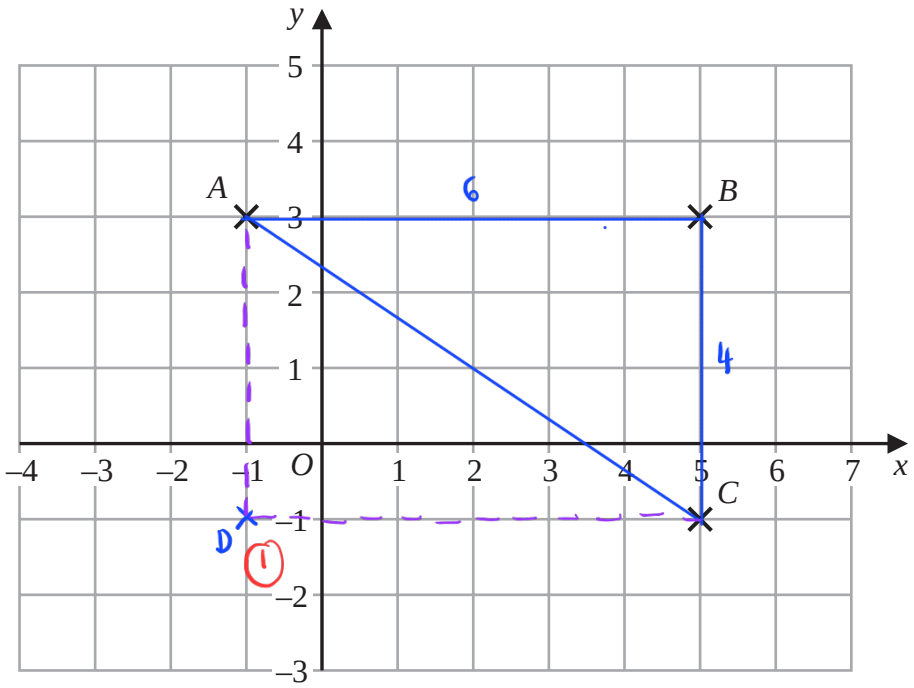
(c) Write down an equation of the line CD.

$y = -3$ (1)

(1)

(Total for Question 5 is 3 marks)

6 The three points *A*, *B* and *C* are marked on a centimetre grid.



(a) Write down the coordinates of *A*

(-1 , 3) (1)

(b) Find the coordinates of the midpoint of *BC*

B = (5, 3) , C = (5, −1)

midpoint of BC = $\left(\frac{5+5}{2}, \frac{3+(-1)}{2}\right)$ = (5, 1)

(5 , 1) (2)

(c) Work out the area of triangle *ABC*

Area = $\frac{1}{2} \times 6 \times 4$

= 12 cm²

12 cm² (2)

D is the point on the grid so that *ABCD* is a rectangle.

(d) On the grid, mark with a cross (×) the point *D*
Label this point *D*

(1)

(Total for Question 6 is 6 marks)

7 Two circles, C_1 and C_2, are drawn on a centimetre grid, with a scale of 1 cm for 1 unit on each axis.

The centre of circle C_1 is at the point with coordinates (–1, 3) and the radius of C_1 is 13 cm.

The centre of circle C_2 is at the point with coordinates (7, 18) and the radius of C_2 is 6 cm.

(a) Work out the distance between the centre of C_1 and the centre of C_2

$(18-3)^2 + (7-(-1))^2 = 289$ (1)

distance : $\sqrt{289}$ (1)

$= 17$ (1)

17

..... cm

(3)

(b) Explain why circle C_1 intersects circle C_2

Total radii = 19 cm. Distance = 17 cm. They overlap by 2 cm. (1)

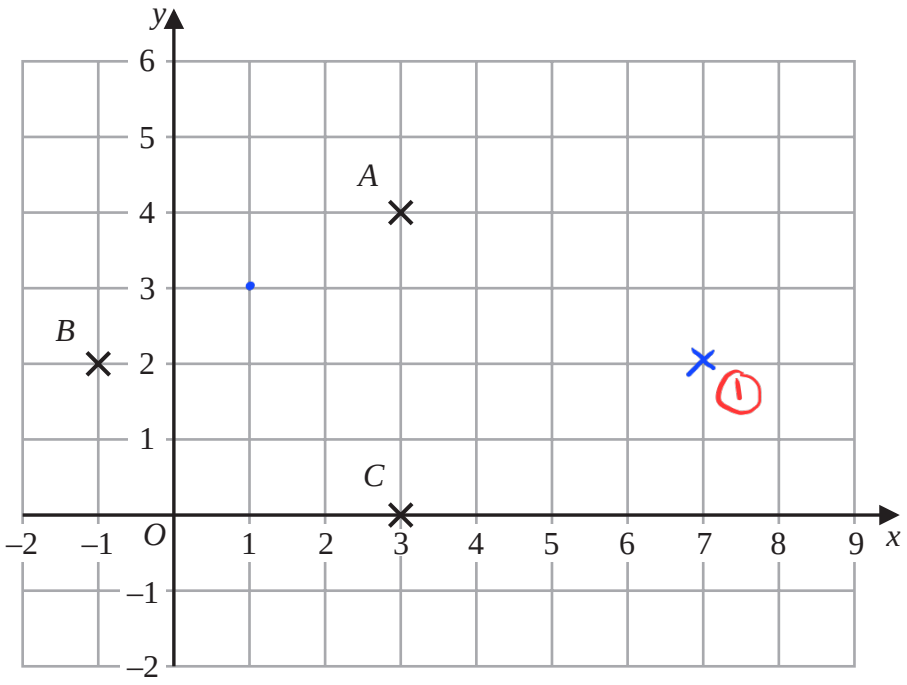
.....

.....

(1)

(Total for Question 7 is 4 marks)

8 The diagram shows three points, A, B and C, on a grid.



(a) Write down the coordinates of

(i) point A

(3 , 4) (1)

(ii) point B

(−1 , 2) (1)

(2)

D is the point such that $ABCD$ is a rhombus.

(b) On the grid, mark with a cross (×) the point D
Label this point D

(1)

(c) Find the coordinates of the midpoint of AB

midpoint AB : $\left(\frac{3+(-1)}{2}, \frac{4+2}{2}\right)$

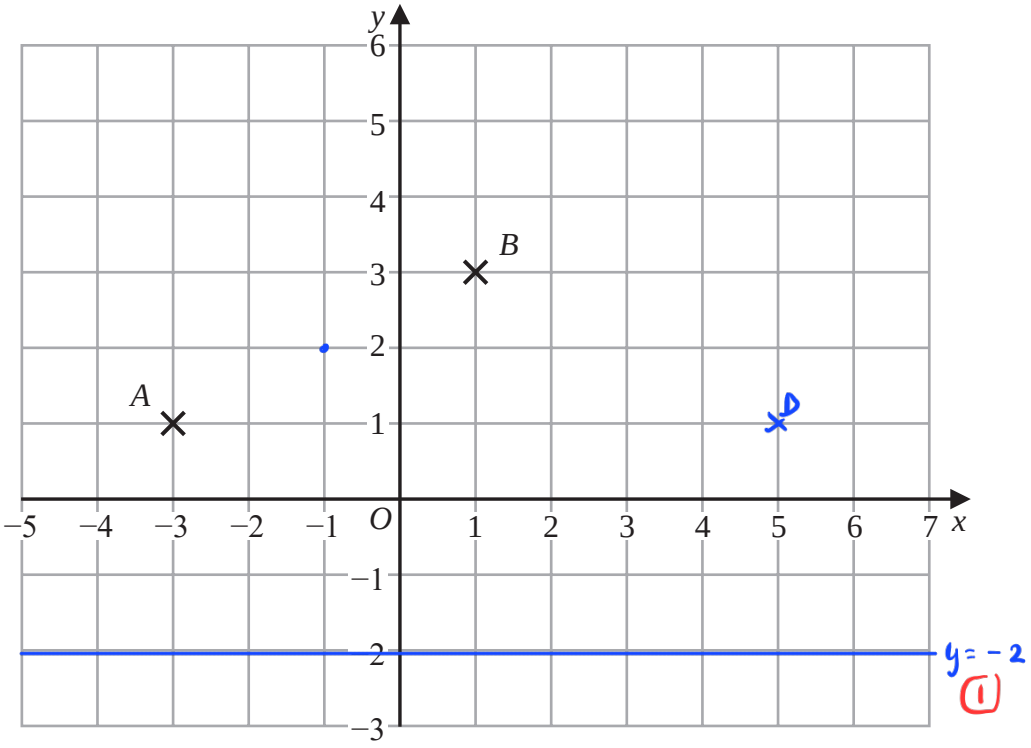
: (1, 3)

(1 , 3) (2)

(2)

(Total for Question 8 is 5 marks)

9 The diagram shows points A and B marked on a grid of squares.



(b) Find the coordinates of M

$M = \left(\frac{1+(-3)}{2}, \frac{3+1}{2}\right)$

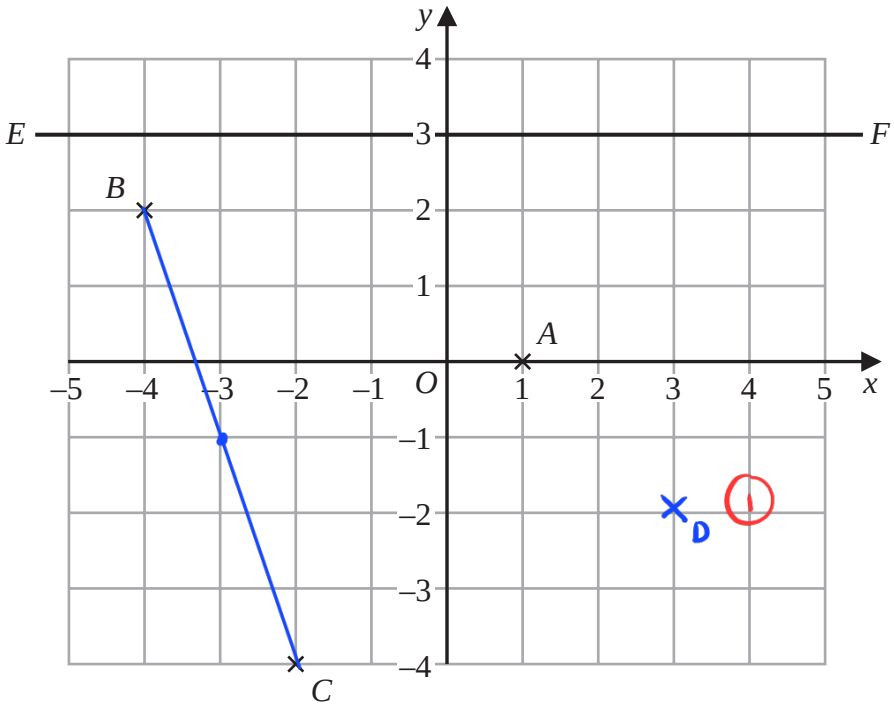
$= (-1, 2)$

(2)

(−1 , 2)

(Total for Question 9 is 2 marks)

10 The diagram shows three points, *A*, *B* and *C*, and a line *EF* on a grid.



(a) Write down the coordinates of the point *A*

(1 , 0) (1)

The coordinates of the point *D* are (3, –2)

(b) On the grid, mark with a cross (×) the position of *D*
Label the cross *D*

(1)

(c) Find the coordinates of the midpoint of *BC*

(–3 , –1) (2)

(d) Write down the equation of the line *EF*

y = 3 (1)

(Total for Question 10 is 5 marks)

11 The points A and B are on a coordinate grid.

The coordinates of A are (6, 4)
The coordinates of B are (17, j) where j is a constant.

The midpoint of AB has coordinates (k, 15) where k is a constant.

Find the value of j and the value of k

$k = \frac{6+17}{2}$ (1)

$= 11.5$

$\frac{4+j}{2} = 15$ (1)

$j = 30 - 4$

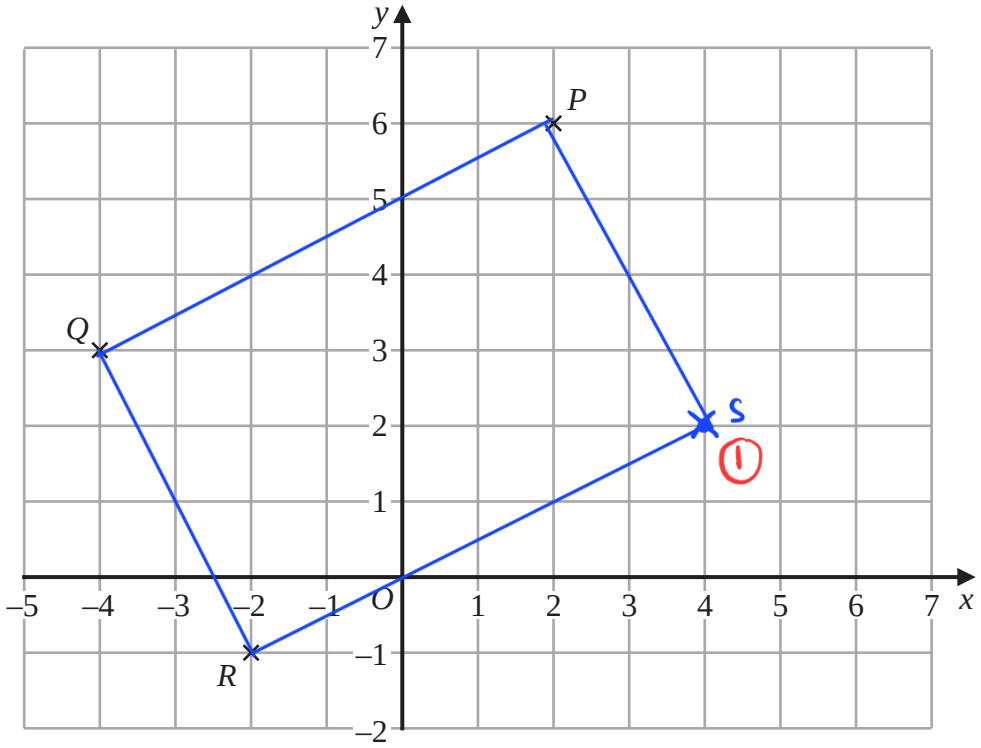
$= 26$ (1)

$j =$ 26

$k =$ 11.5

(Total for Question 11 is 3 marks)

12



(a) Write down the coordinates of the point

(i) P

(2 , 6) (1)

(1)

(ii) Q

(−4 , 3) (1)

(1)

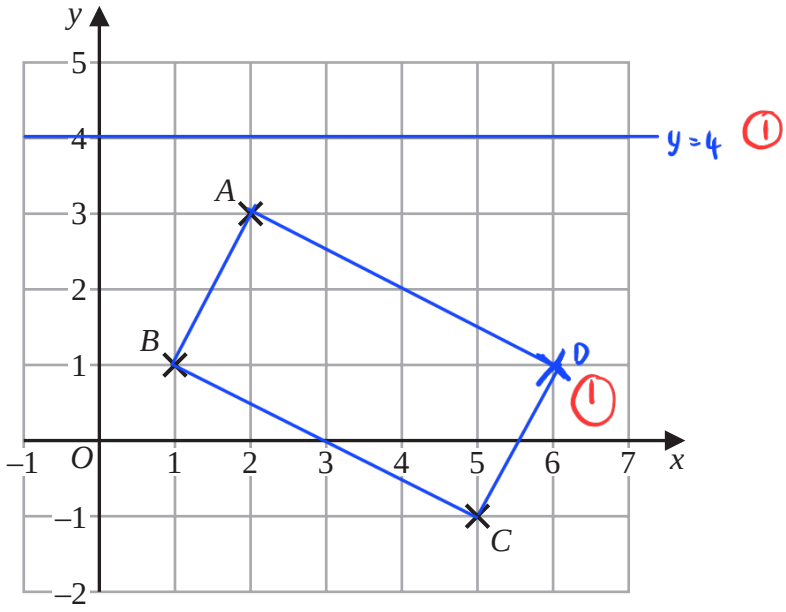
(b) On the grid above, mark with a cross (×) the point S so that $PQRS$ is a rectangle.

(1)

(1)

(Total for Question 12 is 3 marks)

13 The diagram shows three points, A, B and C, marked on a grid.



(a) Write down the coordinates of point A

(2, 3) (1)

(b) On the grid, mark with a cross (×) the point D so that $ABCD$ is a rectangle.

(1)

(c) Find the coordinates of the midpoint of AC

A(2,3) , C(5,-1)

midpoint AC : $\left(\frac{2+5}{2}, \frac{3-1}{2}\right)$

$= (3.5, 1)$ (2)

(3.5, 1) (2)

(d) On the grid, draw the line with equation $y = 4$

(1)

(Total for Question 13 is 5 marks)