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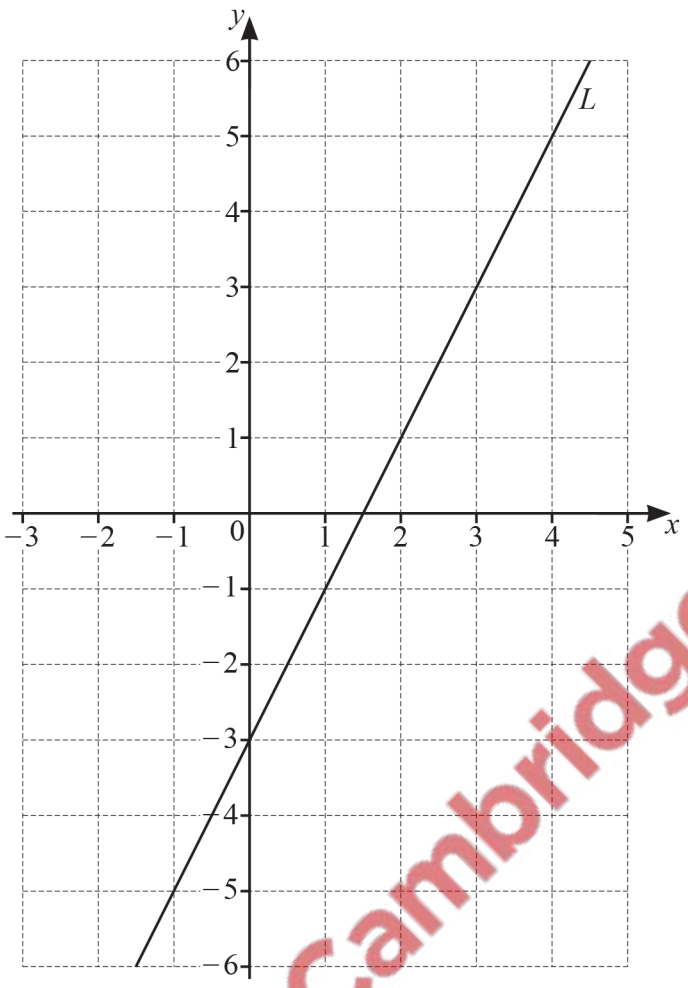
Topical Worksheets for Cambridge IGCSE™

Mathematics (0580/0980)

Coordinate Geometry

1st edition, for examination until 2025

1



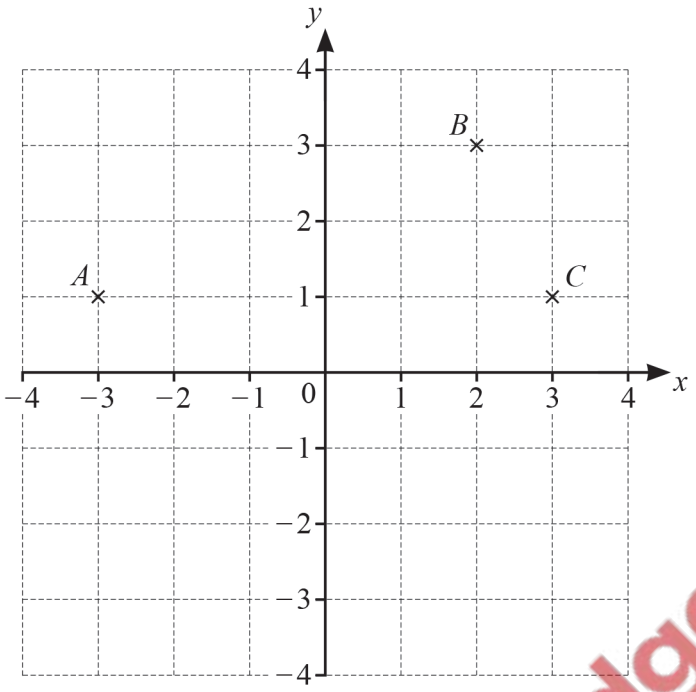
(a) Find the equation of line L in the form $y = mx + c$.

$y =$ ..... [2]

(b) On the grid, draw a line that is perpendicular to line L. [1]

[Total: 3]

2



Points A, B and C are shown on the grid.

(a) Write down the coordinates of point C.

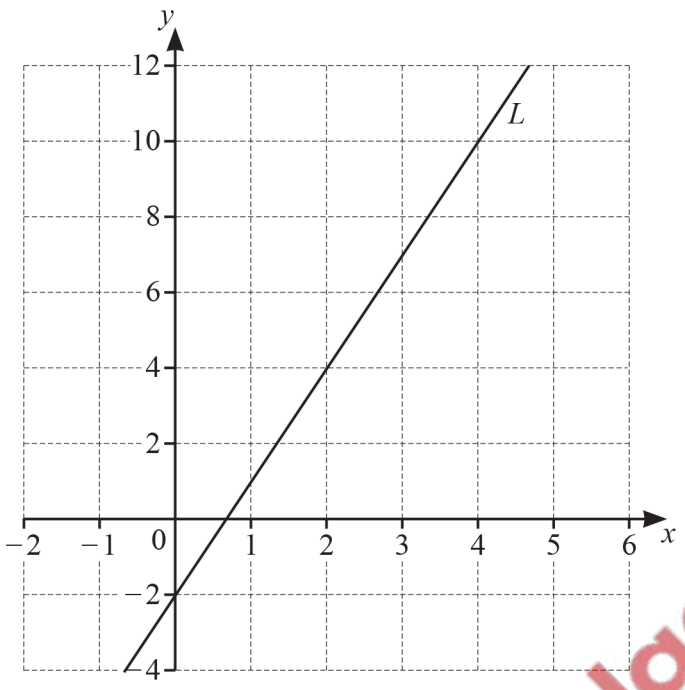
(..... , ...) [1]

(b) On the grid, plot point D so that $ABCD$ is a parallelogram. [1]

(c) On the grid, plot point E so that $\overrightarrow{EA} = \begin{pmatrix} -4 \\ 3 \end{pmatrix}$. [2]

[Total: 4]

3



(a) Find the gradient of line L.

..... [2]

(b) Write down the equation of line L in the form $y = mx + c$.

$y =$ ..... [1]

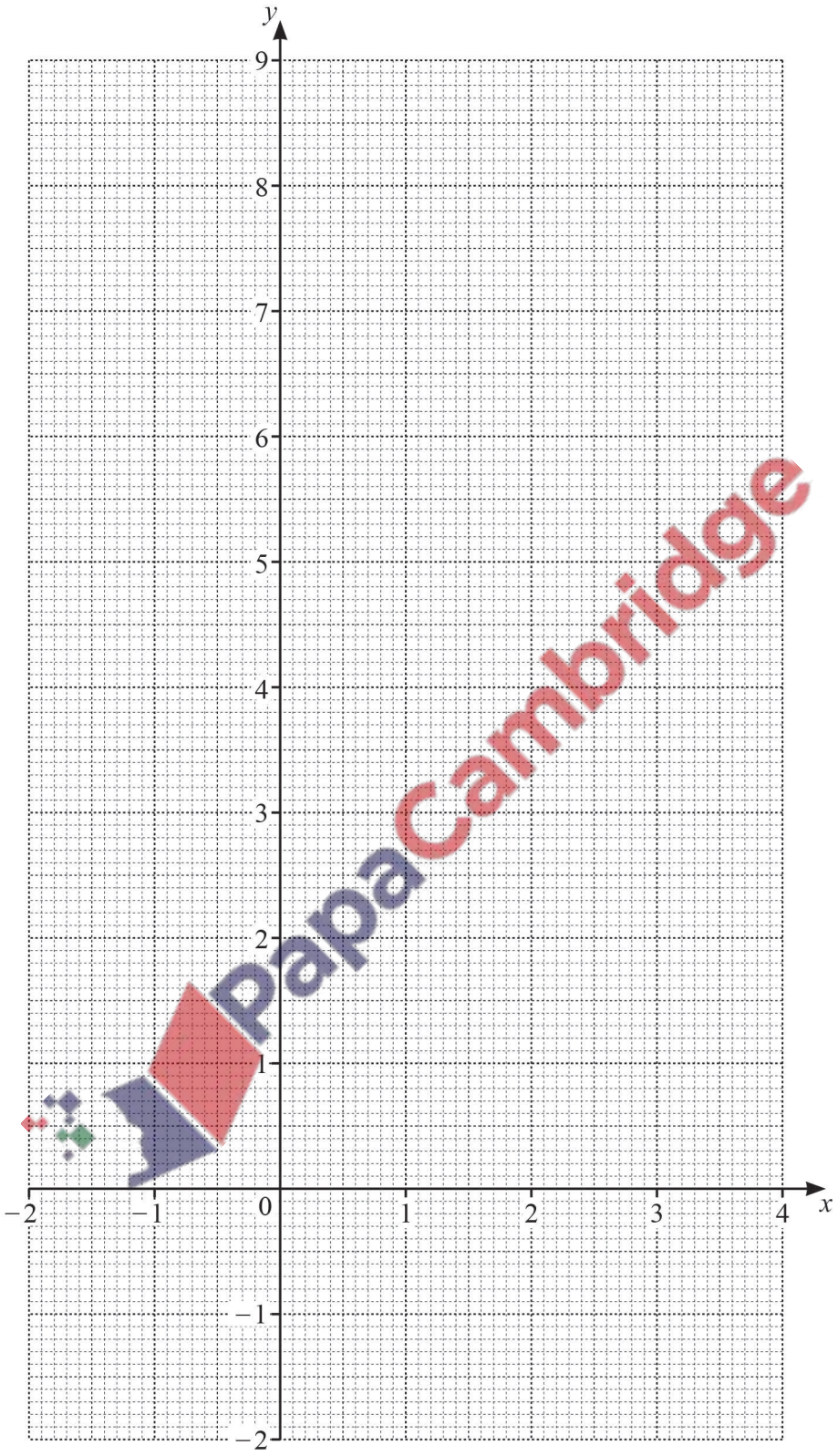
[Total: 3]

4 **(a)** Complete the table of values for $y = 7 + 2x - x^2$.

x	−2	−1	0	1	2	3	4
y	−1			8	7		−1

[2]

(b) On the grid, draw the graph of $y = 7 + 2x - x^2$ for $-2 \leqslant x \leqslant 4$.



[4]

(c) Write down the equation of the line of symmetry of the graph.

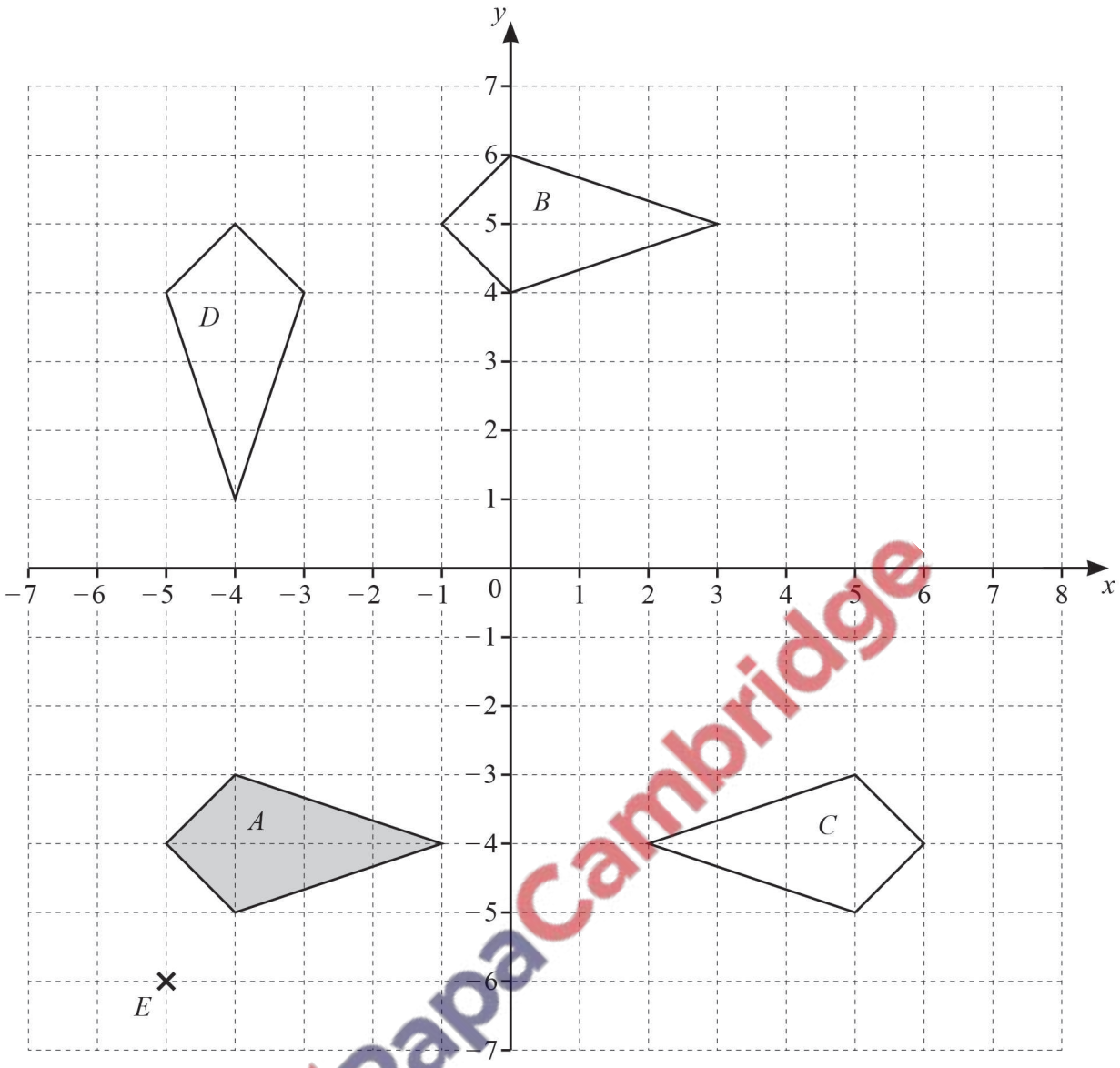
..... [1]

(d) Use your graph to solve the equation $7 + 2x - x^2 = 0$.

$x =$ ..... or $x =$ ..... [2]

[Total: 9]

5 The grid shows a point E and four quadrilaterals, A, B, C and D.



(a) Write down the mathematical name of shape *A*.

..... [1]

(b) Describe fully the **single** transformation that maps

(i) shape *A* onto shape *B*,

.....

..... [2]

(ii) shape *A* onto shape *C*,

.....

..... [2]

(iii) shape A onto shape D.

.....

..... [3]

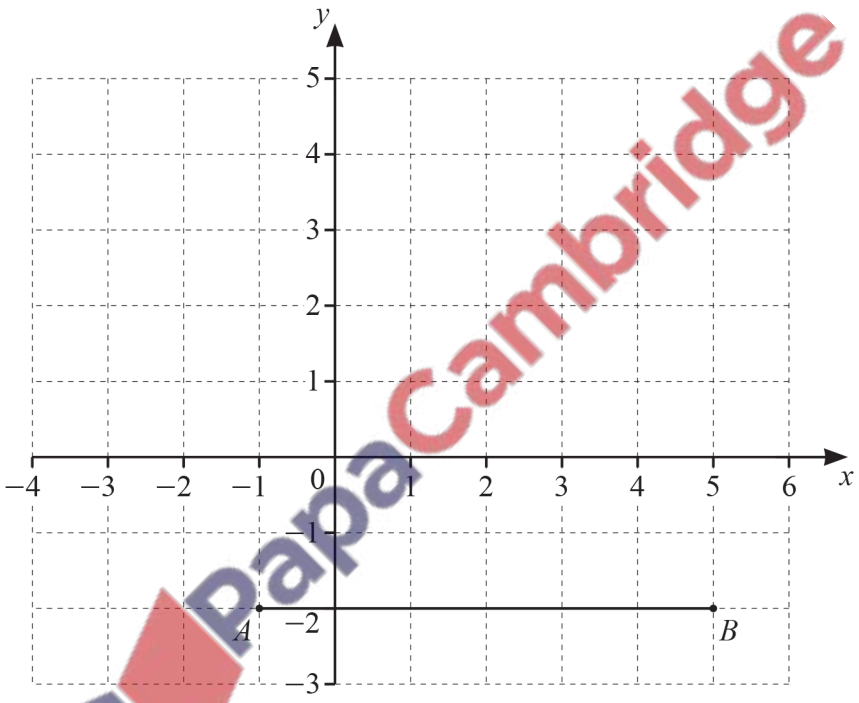
(c) **(i)** Write down the coordinates of the point E.

(..... , ...) [1]

(ii) On the grid, draw the image of shape A after an enlargement by scale factor 3, centre E. [2]

[Total: 11]

6 The diagram shows a line AB on a 1 cm^2 grid.



(a) Write down the coordinates of point A.

(..... , ...) [1]

(b) Write down the vector $\overrightarrow{AB}$.

$\begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [1]

(c) $\overrightarrow{BC} = \begin{pmatrix} -2 \\ 5 \end{pmatrix}$

Mark point C on the grid. [1]

(d) **(i)** Work out $\overrightarrow{AB} + \overrightarrow{BC}$.

( ) [1]

(ii) Complete this statement.

$$\overrightarrow{AB} + \overrightarrow{BC} = \overrightarrow{\quad\quad}$$

..... [1]

(e) A, B and C are three vertices of a parallelogram, $ABCD$.

(i) Mark point D on the diagram and draw the parallelogram $ABCD$. [1]

(ii) Work out the area of the parallelogram.
Give the units of your answer.

.... [2]

[Total: 8]

7 A rhombus $ABCD$ has a diagonal AC where A is the point $(-3, 10)$ and C is the point $(4, -4)$.

(a) Calculate the length AC.

..... [3]

(b) Show that the equation of the line AC is $y = -2x + 4$.

[2]

(c) Find the equation of the line BD.

..... [4]

[Total: 9]

8 The line $y = 3x - 2$ crosses the y-axis at G.

Write down the coordinates of G.

(..... , ...) [1]

[Total: 1]

9 The equation of line L is $3x - 8y + 20 = 0$.

(a) Find the gradient of line L.

..... [2]

(b) Find the coordinates of the point where line L cuts the y-axis.

(..... , ...) [1]

[Total: 3]

10 The coordinates of P are $(-3, 8)$ and the coordinates of Q are $(9, -2)$.

(a) Calculate the length PQ.

..... [3]

(b) Find the equation of the line parallel to PQ that passes through the point $(6, -1)$.

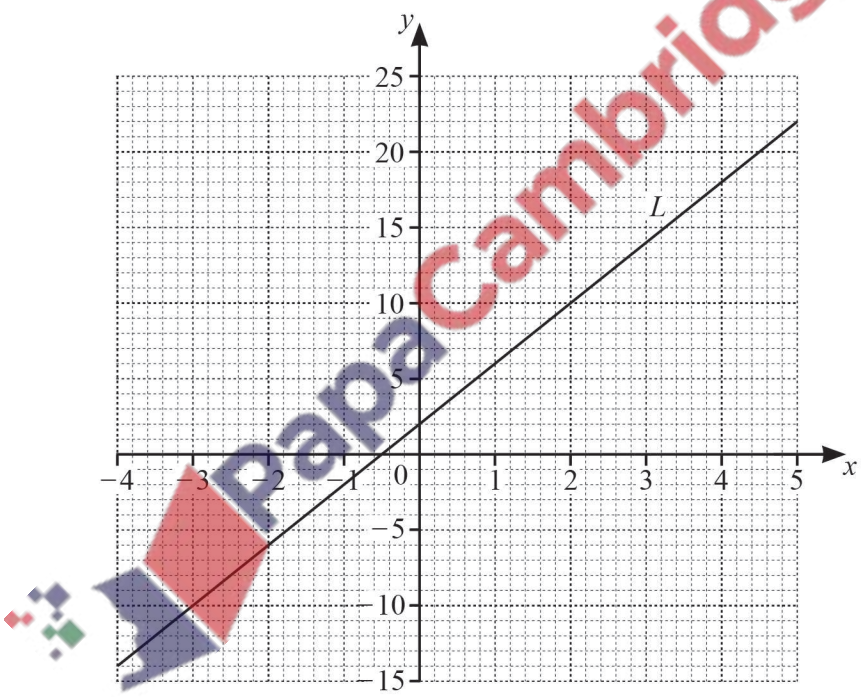
..... [3]

(c) Find the equation of the perpendicular bisector of PQ.

..... [4]

[Total: 10]

11 The line L is shown on the grid.



(a) Find the equation of the line L in the form $y = mx + c$.

$y =$ ..... [3]

(b) The equation of a different line is $y = 3x - 4$.

(i) Write down the gradient of this line.

..... [1]

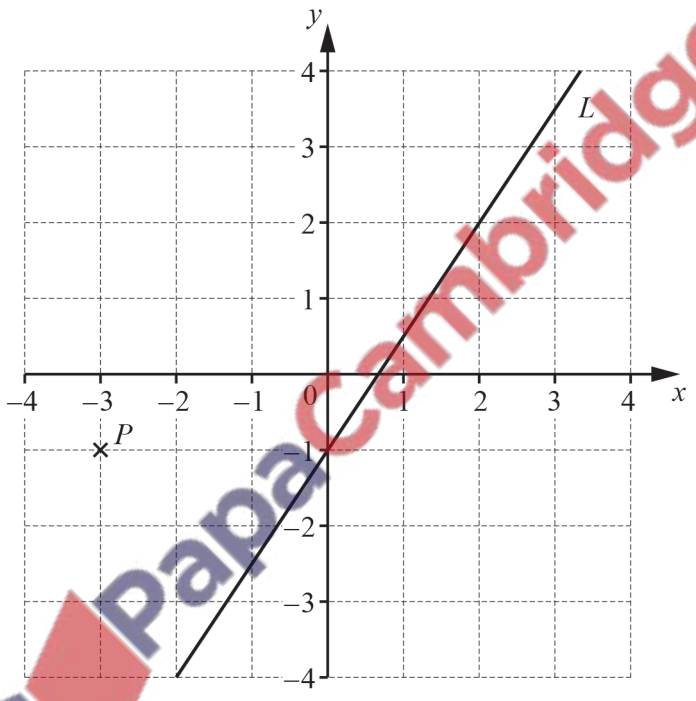
(ii) Write down the co-ordinates of the point where this line crosses the y-axis.

(..... , ...) [1]

(c) On the grid, draw the graph of $y = -2x + 1$ for $-4 \leqslant x \leqslant 5$. [3]

[Total: 8]

12 The diagram shows a point P and a line L.



(a) Write down the co-ordinates of point P.

(..... , ...) [1]

(b) Find the gradient of line L.

..... [2]

(c) Write down the equation of line L in the form $y = mx + c$.

$y =$ ..... [2]

[Total: 5]

13 Find the co-ordinates of the point where the line $y = 3x - 8$ crosses the y-axis.

(..... , ...) [1]

[Total: 1]

14 Line L passes through the points $(0, -3)$ and $(6, 9)$.

(a) Find the equation of line L.

..... [3]

(b) Find the equation of the line that is perpendicular to line L and passes through the point $(0, 2)$.

..... [2]

[Total: 5]

15 Write down the gradient of the line $y = 3x - 8$.

..... [1]

[Total: 1]

16 A is the point (7, 12) and B is the point (2, −1).

Find the length of AB.

..... [3]

[Total: 3]

17 Write down the equation of the straight line that

- passes through the origin

and

- is parallel to $y = 6x - 3$.

..... [1]

[Total: 1]

18 Write down the co-ordinates of the point where the line $y = 6x - 3$ crosses the y-axis.

(..... , ...) [1]

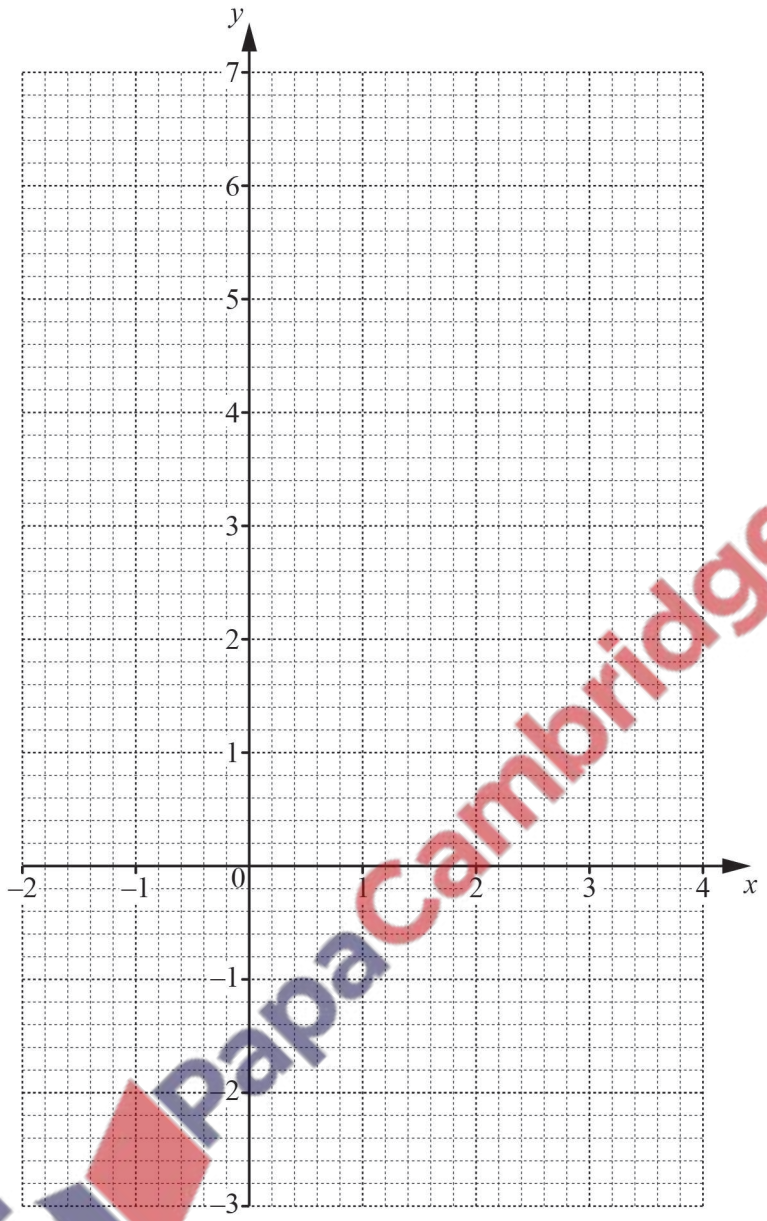
[Total: 1]

19 **(a)** Complete the table of values for $y = 5 + 2x - x^2$.

x	−2	−1	0	1	2	3	4
y		2	5	6			−3

[2]

(b) On the grid, draw the graph of $y = 5 + 2x - x^2$ for $-2 \leqslant x \leqslant 4$.



[4]

(c) **(i)** On the grid, draw the line of symmetry. [1]

(ii) Write down the equation of the line of symmetry.

..... [1]

(d) Use your graph to find the solutions of the equation $5 + 2x - x^2 = 4$.

$x =$ ..... or $x =$ ..... [2]

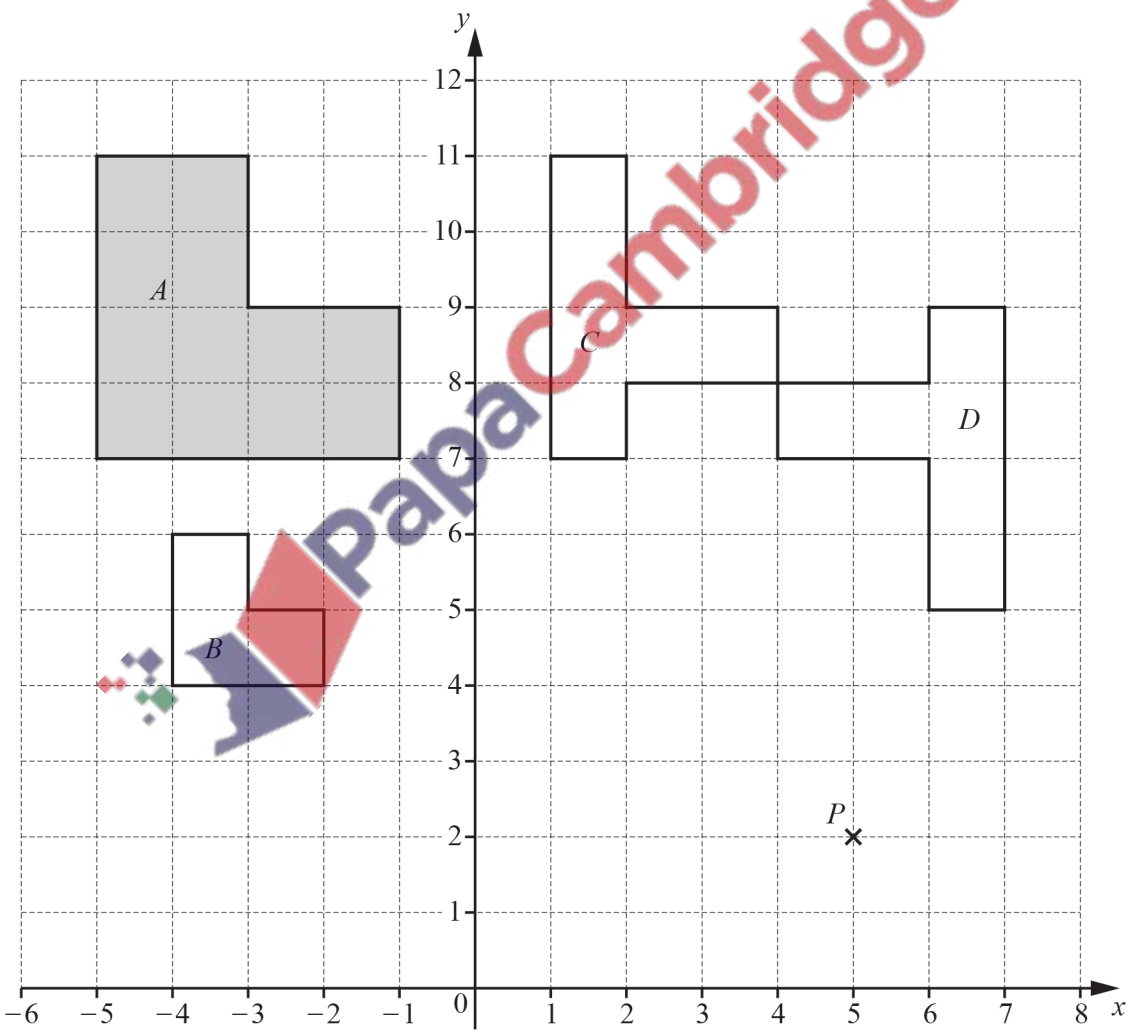
(e) **(i)** On the grid, draw a line from (−1, 2) to (1, 6). [1]

(ii) Find the equation of this line in the form $y = mx + c$.

$y =$ ..... [3]

[Total: 14]

20 The diagram shows four shapes A, B, C and D and a point P on a 1 cm^2 grid.



(a) Find

(i) the perimeter of shape A,

..... cm [1]

(ii) the area of shape A.

..... cm^2 [1]

(b) **(i)** Write down the co-ordinates of point P.

(..... , ...) [1]

(ii) Find the co-ordinates of the image of point P when

A P is reflected in the y-axis,

(..... , ...) [1]

B P is reflected in the line $y = 6$.

(..... , ...) [2]

(iii) Find the vector that translates point P to the point $(49, -12)$.

$\begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [2]

(c) Describe fully the **single** transformation that maps

(i) shape A onto shape B,

.....

..... [3]

(ii) shape C onto shape D.

.....

..... [3]

[Total: 14]

21 The points $(9, a)$ and $(b, 3)$ lie on the line $y = \frac{2}{3}x - 7$.

Work out the value of

(a) a,

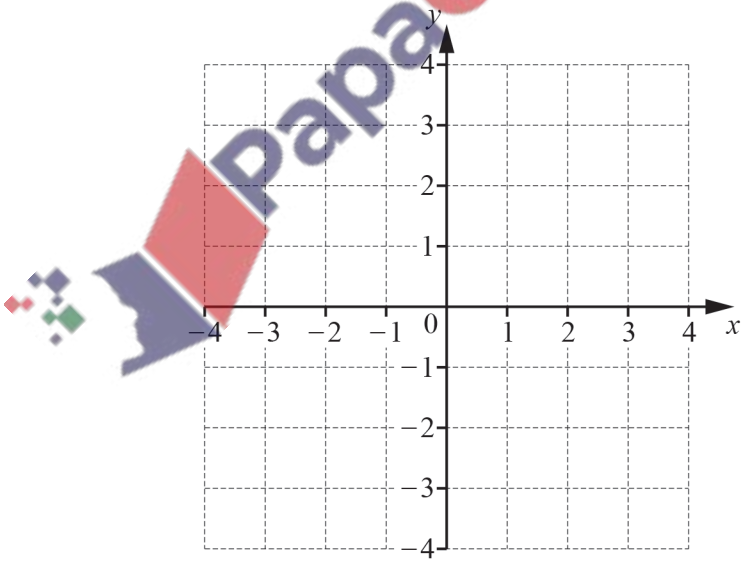
$a =$ ..... [2]

(b) b.

$b =$ ..... [2]

[Total: 4]

22



(a) On the grid, draw the line through the point $(-3, -2)$ that is perpendicular to the y-axis.

[1]

(b) On the grid, draw the line $y = -2x$.

[1]

[Total: 2]

23 The equation of a straight line is $2y = 3x + 4$.

(a) Find the gradient of this line.

..... [1]

(b) Find the co-ordinates of the point where the line crosses the y-axis.

(..... , ...) [1]

[Total: 2]

24 A is the point (8, 5) and B is the point (−4, 1).

(a) Calculate the length of AB.

..... [3]

(b) Find the co-ordinates of the midpoint of AB.

(..... , ...) [2]

[Total: 5]

25 A straight line joins the points A (−2, -3) and C (1, 9).

(a) Find the equation of the line AC in the form $y = mx + c$.

$y =$ ..... [3]

(b) Calculate the acute angle between AC and the x-axis.

..... [2]

(c) $ABCD$ is a kite, where AC is the longer diagonal of the kite.
B is the point (3.5, 2).

(i) Find the equation of the line BD in the form $y = mx + c$.

$y =$ ..... [3]

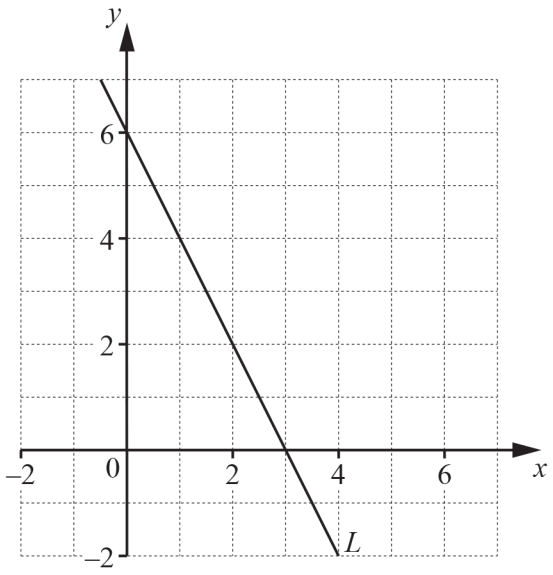
(ii) The diagonals AC and BD intersect at (–0.5, 3).

Work out the co-ordinates of D.

(..... , ...) [2]

[Total: 10]

26 The diagram shows a straight line L.



(a) Find the equation of line L.

..... [3]

(b) Find the equation of the line perpendicular to line L that passes through (9, 3).

..... [3]

[Total: 6]

27 A is the point (2, 3) and B is the point (7, −5).

Find the equation of the line through A that is perpendicular to AB.
Give your answer in the form $y = mx + c$.

$y =$ ..... [4]

[Total: 4]

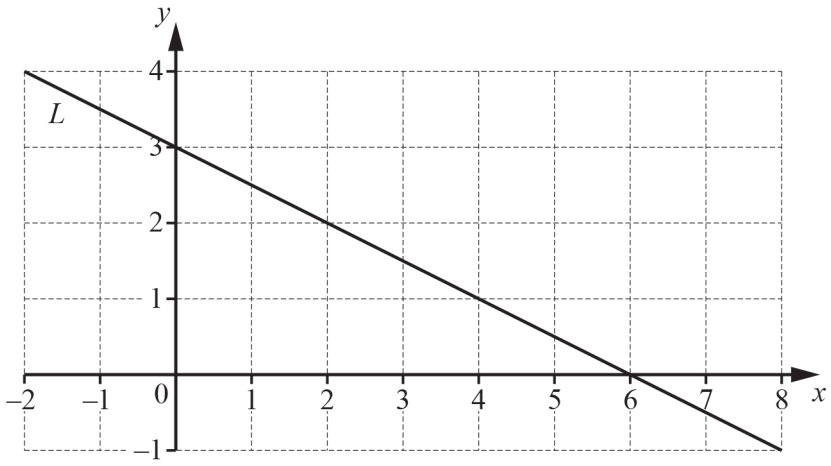
28 A is the point (2, 3) and B is the point (7, −5).

Find the co-ordinates of the midpoint of AB.

(..... , ...) [2]

[Total: 2]

29



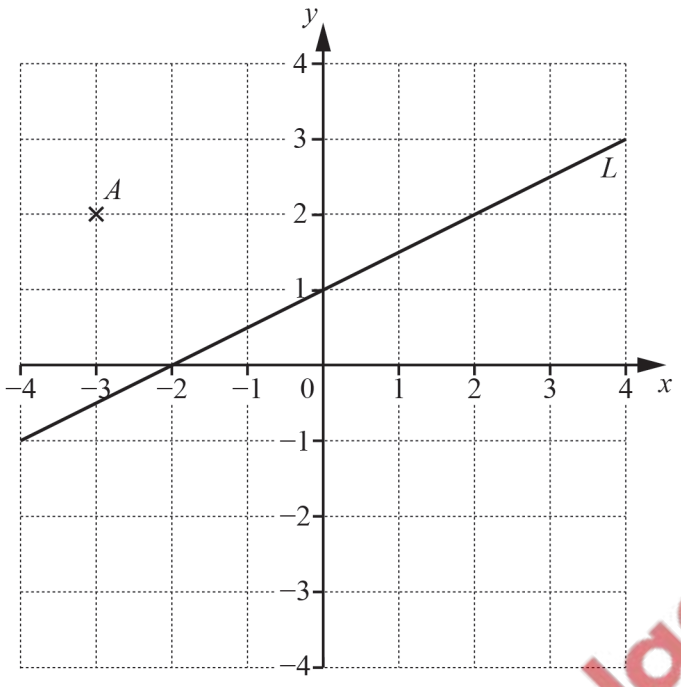
Line L is drawn on the grid.

Find the equation of line L.
Give your answer in the form $y = mx + c$.

$y =$ ..... [3]

[Total: 3]

30



(a) Find the gradient of line L.

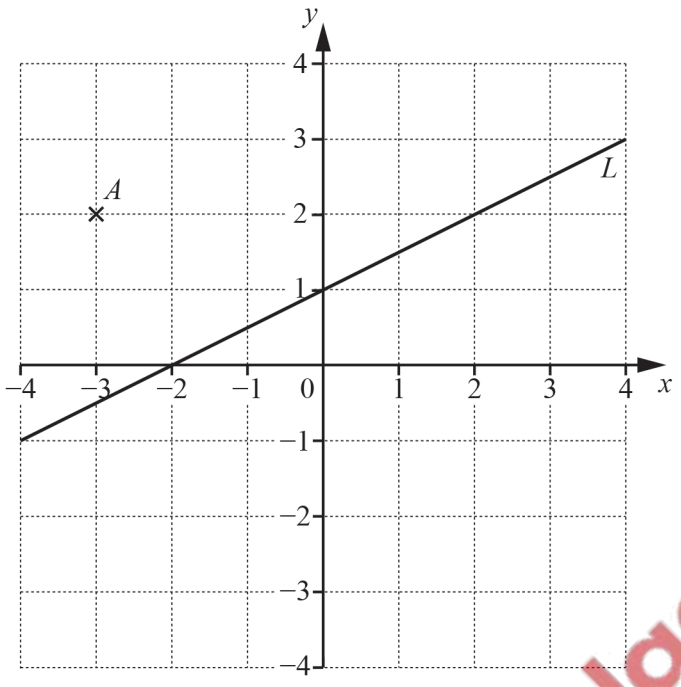
..... [2]

(b) Find the equation of line L in the form $y = mx + c$.

$y =$ ..... [1]

[Total: 3]

31



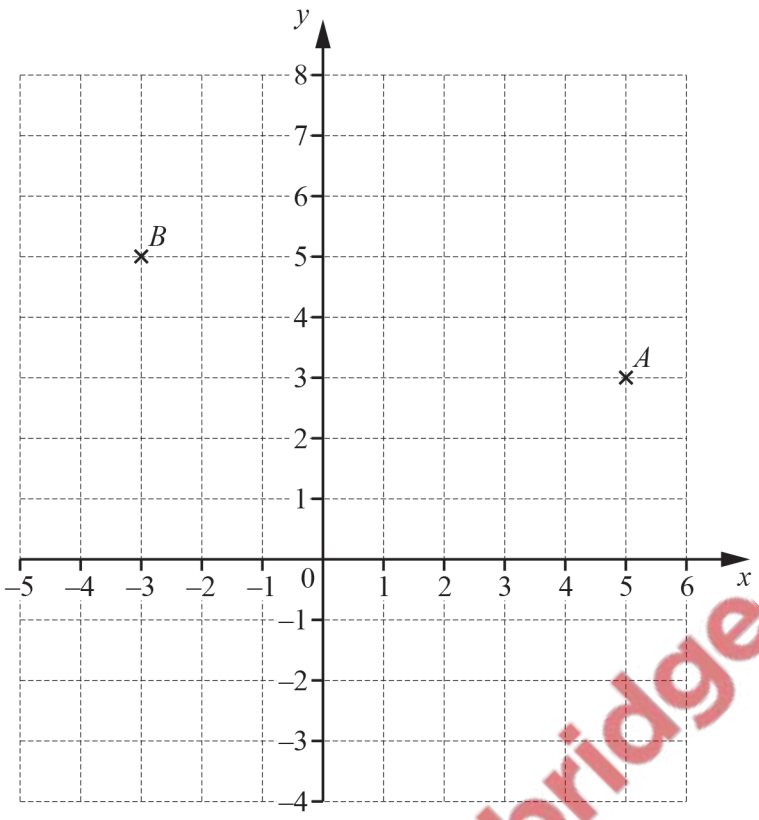
(a) Write down the co-ordinates of point A.

(..... , ...) [1]

(b) On the grid, plot point B (1, –3). [1]

[Total: 2]

32



(a) Write down the co-ordinates of point A.

(..... , ...) [1]

(b) Plot the point C at (4, −3). [1]

(c) Find the vector $\overrightarrow{AB}$.

$\overrightarrow{AB} = \begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [1]

[Total: 3]

33 For the line $y = 4x - 6$, write down

(a) the gradient,

..... [1]

(b) the y-intercept.

..... [1]

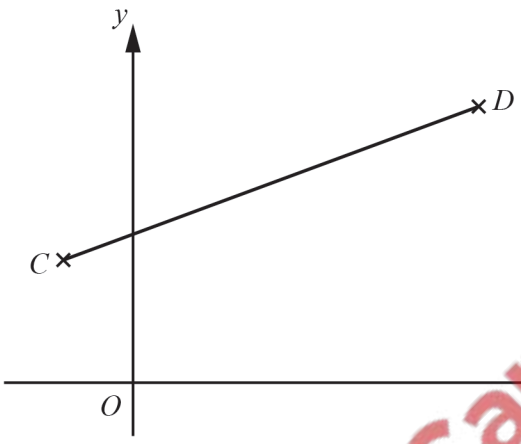
[Total: 2]

34 Find the mid-point of AB where $A = (w, r)$ and $B = (3w, t)$.
Give your answer in its simplest form in terms of w, r and t.

(..... , ...) [2]

[Total: 2]

35



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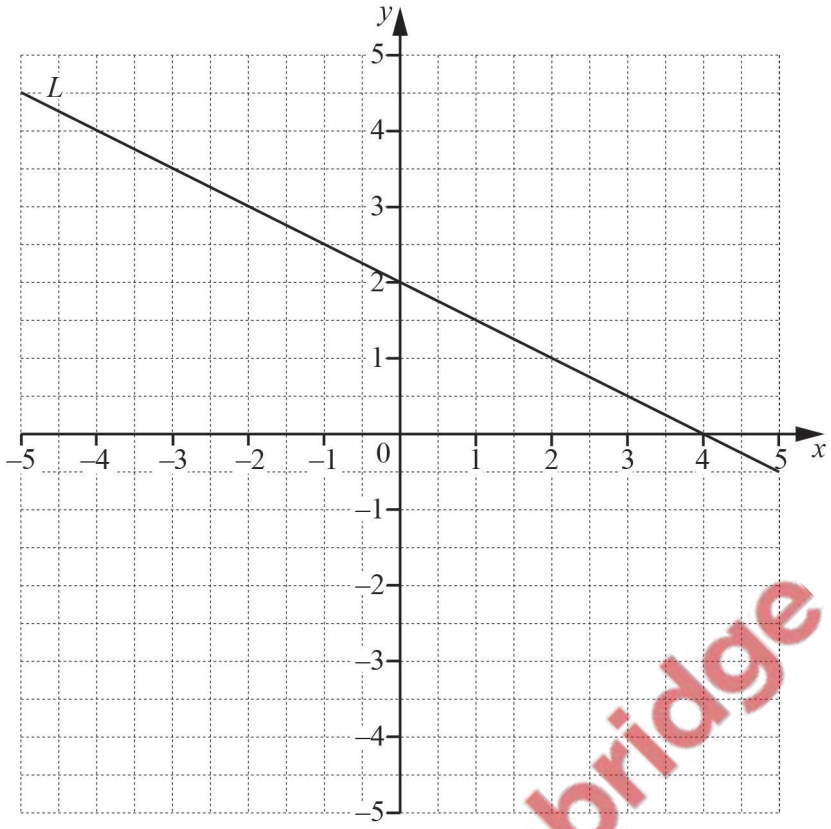
The diagram shows the points $C(-1, 2)$ and $D(9, 7)$.

Find the equation of the line perpendicular to CD that passes through the point $(1, 3)$.
Give your answer in the form $y = mx + c$.

$y =$ ..... [4]

[Total: 4]

36



Line L is drawn on the grid.

(a) Find the equation of line L in the form $y = mx + c$.

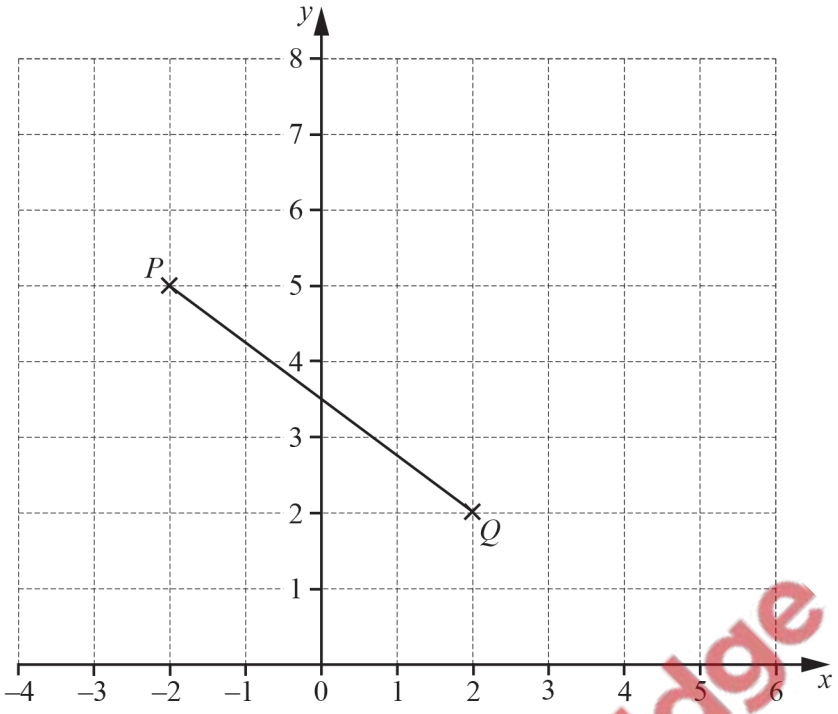
$y =$ ..... [3]

(b) Line P is parallel to line L and passes through the point $(0, -1)$.

On the grid above, draw line P for $-5 \leqslant x \leqslant 5$. [2]

[Total: 5]

37



(a) Write down the co-ordinates of point P.

(..... , ...) [1]

(b) Write down the column vector $\overrightarrow{PQ}$.

$\overrightarrow{PQ} = \begin{pmatrix} & \\ & \end{pmatrix}$ [1]

(c) $\overrightarrow{QR} = \begin{pmatrix} 3 \\ 2 \end{pmatrix}$

On the grid, plot point R. [1]

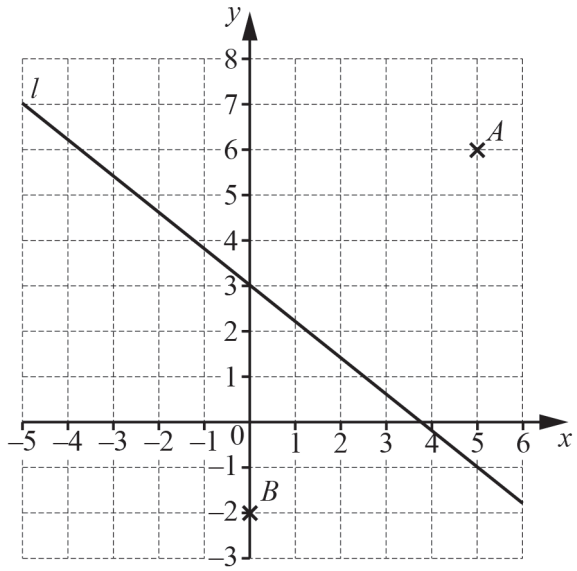
(d) $PQRS$ is a parallelogram.

On the grid, complete the parallelogram $PQRS$.
Write down the co-ordinates of point S.

(..... , ...) [2]

[Total: 5]

38



(a) Write down the co-ordinates of A.

(..... , ...) [1]

(b) Find the equation of line l in the form $y = mx + c$.

$y =$ ..... [3]

(c) Write down the equation of the line parallel to line l that passes through the point B.

..... [2]

(d) C is the point (8, 14).

(i) Write down the equation of the line perpendicular to line l that passes through the point C.

..... [3]

(ii) Calculate the length of AC.

..... [3]

(iii) Find the co-ordinates of the mid-point of BC.

(..... , ...) [2]

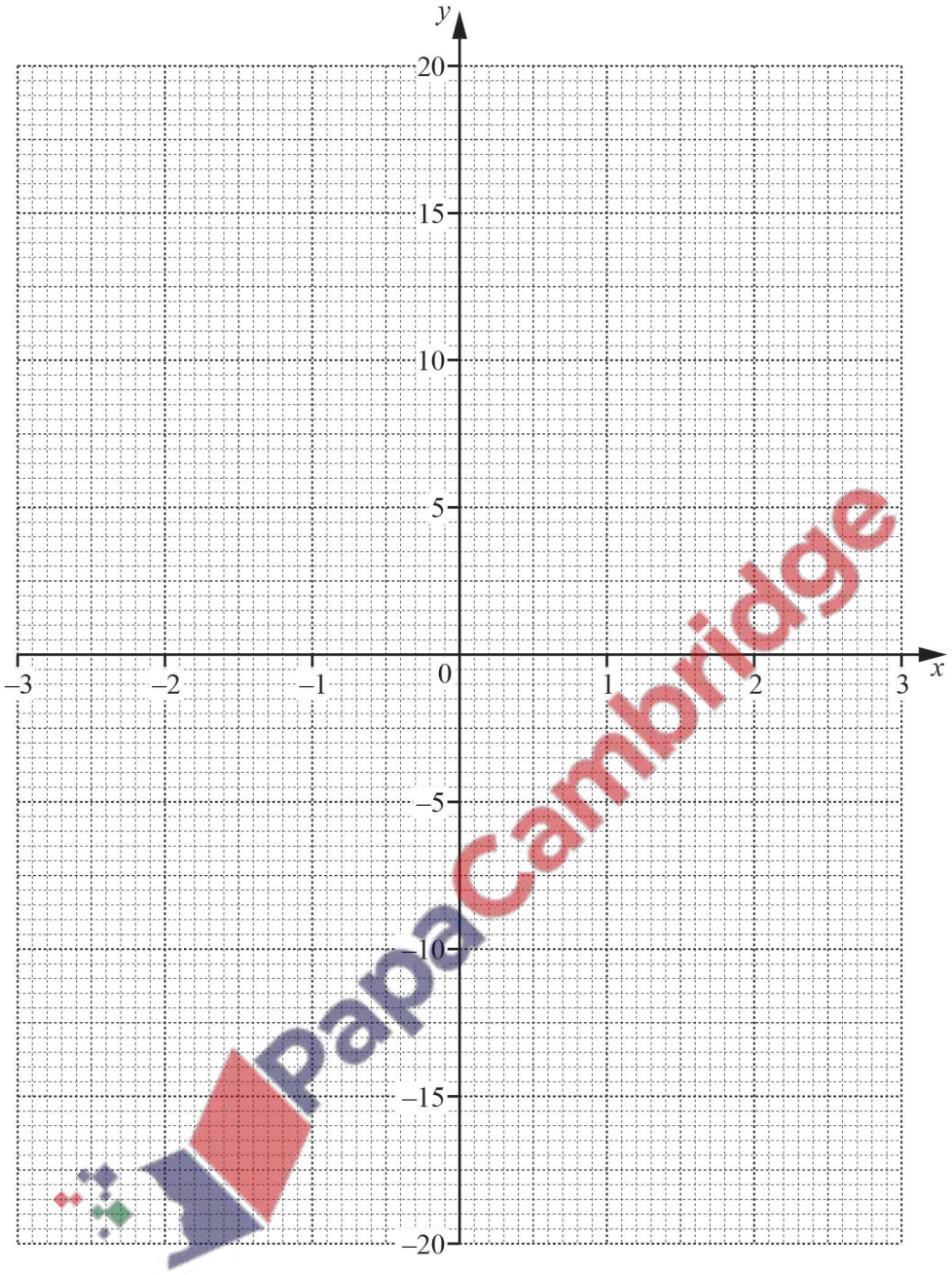
[Total: 14]

39 The table shows some values of $y = x^3 - 3x - 1$.

x	−3	−2.5	−2	−1.5	−1	0	1	1.5	2	2.5	3
y	−19	−9.1		0.1	1	−1	−3	−2.1	1	7.1	

(a) Complete the table of values. [2]

(b) Draw the graph of $y = x^3 - 3x - 1$ for $-3 \leqslant x \leqslant 3$.



[4]

(c) A straight line through (0, –17) is a tangent to the graph of $y = x^3 - 3x - 1$.

(i) On the grid, draw this tangent. [1]

(ii) Find the co-ordinates of the point where the tangent meets your graph.

(..... , ...) [1]

(iii) Find the equation of the tangent.
Give your answer in the form $y = mx + c$.

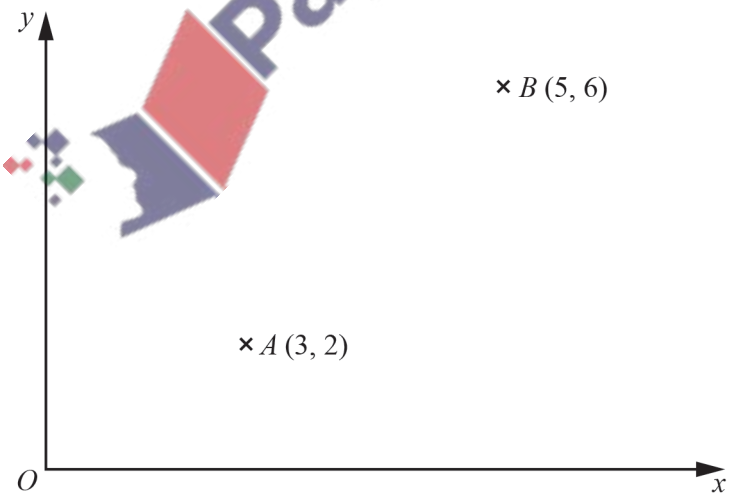
$y =$ ..... [3]

(d) By drawing a suitable straight line on the grid, solve the equation $x^3 - 6x - 3 = 0$.

$x =$ ..... or $x =$ ..... or $x =$ ..... [4]

[Total: 15]

40



(a) Find the column vector $\overrightarrow{AB}$.

$\overrightarrow{AB} = \begin{pmatrix} & \end{pmatrix}$ [1]

(b) Find $\left|\overrightarrow{AB}\right|$.

$\left|\overrightarrow{AB}\right|$ = ... [2]

(c) B is the mid-point of the line AC.

Find the co-ordinates of C.

(..... , ...) [2]

(d) Find the equation of the straight line that passes through A and B.

..... [3]

(e) The straight line that passes through A and B cuts the y-axis at D.

Write down the co-ordinates of D.

(..... , ...) [1]

[Total: 9]