Planner

Functions and graphs

- Finding the equation of a line from coordinates on the line
- Using an equation to complete a table of values
- Plotting and drawing the graph of a linear equation

Keywords

You should know

explanation 1

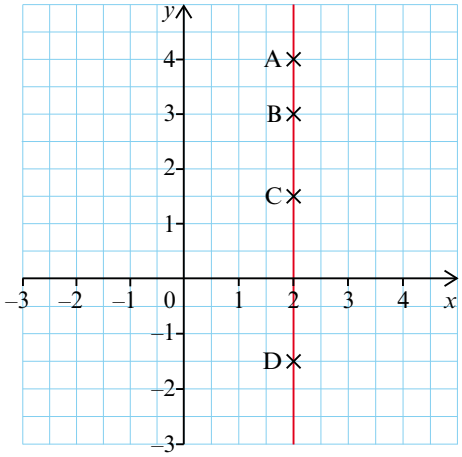
online

1 The graph shows four points A, B, C and D.

a Write the coordinates of A, B, C and D.

b What do you notice about the x-coordinate of each point?

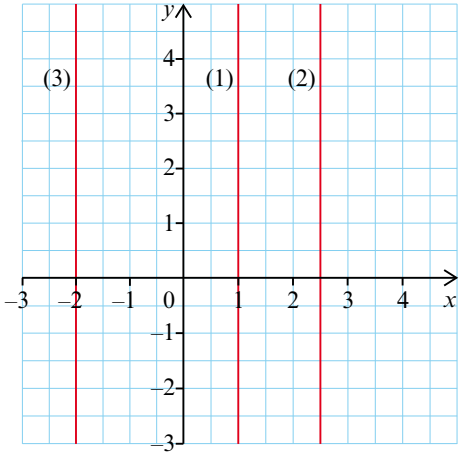
c What is the equation of the red line?



2 The graph shows three straight lines (1), (2) and (3).

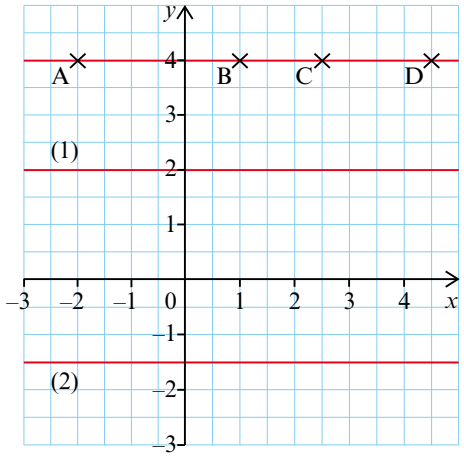
a Write the coordinates of three points that lie on each line.

b Write the equation of each line.



explanation 2 online

3 The graph shows three straight lines.



a Write the coordinates of A, B, C and D.

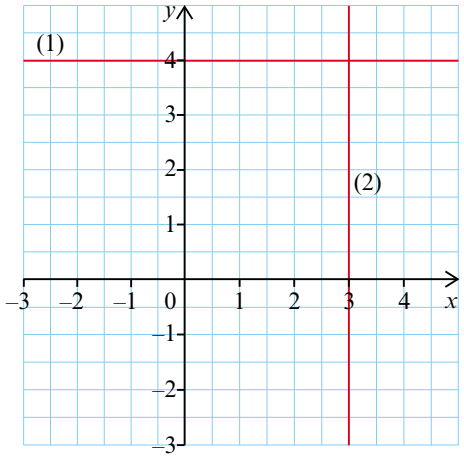
b What do you notice about the y-coordinate of each point?

c Write the equation of the line through points A, B, C and D.

d Find the equation of line (1).

e Find the equation of line (2).

4 The graph shows two straight lines.

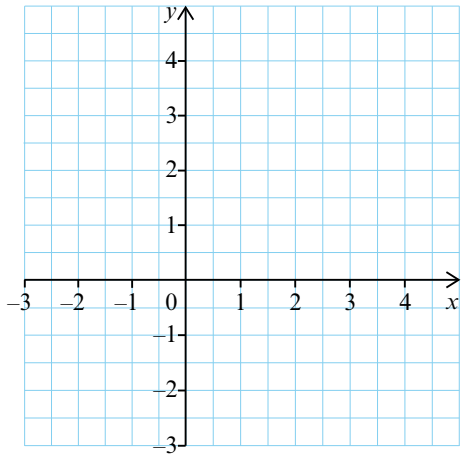


a Write the equations of lines (1) and (2).

b What are the coordinates of the point where lines (1) and (2) cross?

***c** Write the coordinates of the point where the lines $x = 7$ and $y = 3$ cross.

5 Copy the grid onto squared paper.



a Draw the vertical line that passes through the point $(1, -2)$. Label it with its equation.

b Draw the horizontal line that passes through the point $(-2, 3)$. Label it with its equation.

c What are the coordinates of the point where the two lines cross?

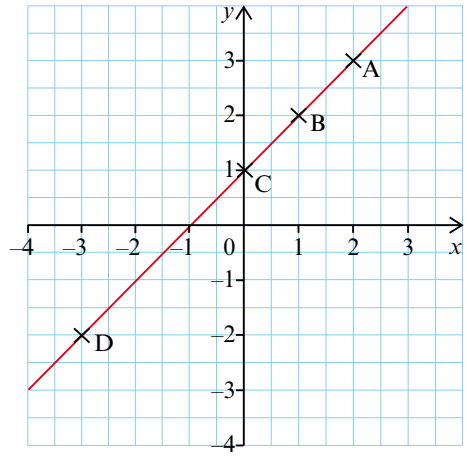
d Write the equations of these lines.

i the vertical line though $(-1.5, 3.5)$

ii the horizontal line though $(77, 99)$

explanation 3 — online

6 The graph shows four points A, B, C and D on a straight line.



a Copy the coordinate table.
Use the four points to complete it.

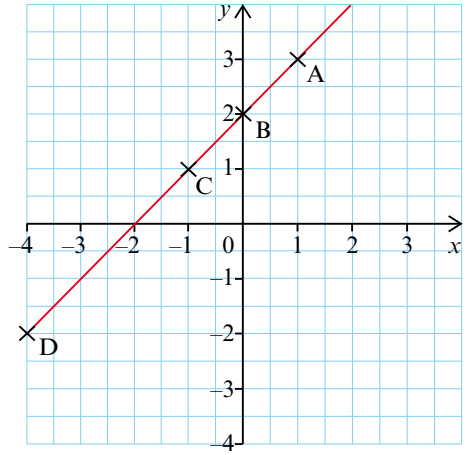
Point	x	y
A	2	3
B		
C		
D		

b Copy and complete the function machine. $x \rightarrow \square \rightarrow y$

c Write the equation of the line. $y =$ _____

d Describe the link between the y-coordinate and the x-coordinate of any point on the line.

7 The graph shows four points A, B, C and D on a straight line.



a Copy the coordinate table.
Use the four points to complete it.

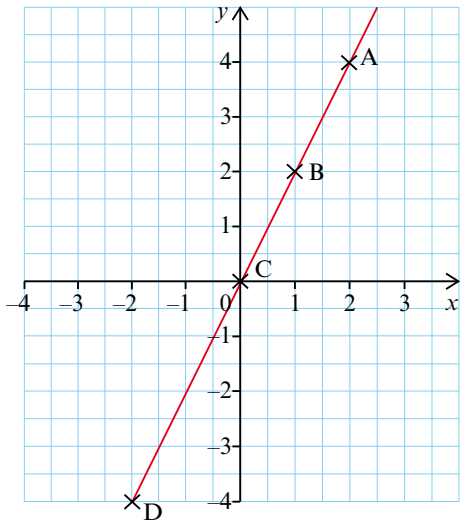
Point	x	y
A	1	3
B		
C		
D		

b Copy and complete the function machine. $x \rightarrow \square \rightarrow y$

c Write the equation of the line. $y =$ _____

d Describe the link between the y-coordinate and the x-coordinate of any point on the line.

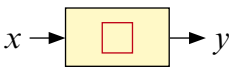
8 The graph shows four points A, B, C and D on a straight line.



a Copy the coordinate table.
Use the four points to complete it.

Point	x	y
A	2	4
B		
C		
D		

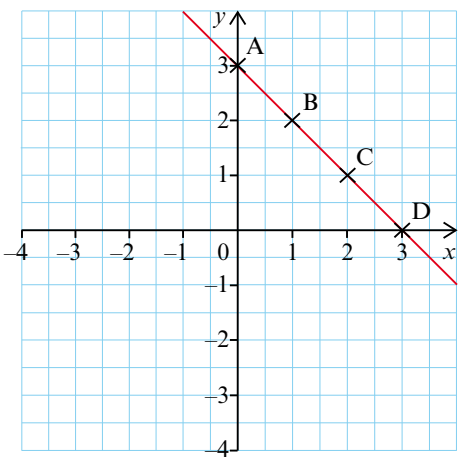
b Copy and complete the function machine



c Write the equation of the line. $y =$ _____

d Describe the link between the y-coordinate and the x-coordinate of any point on the line.

9 The graph shows four points on a straight line.

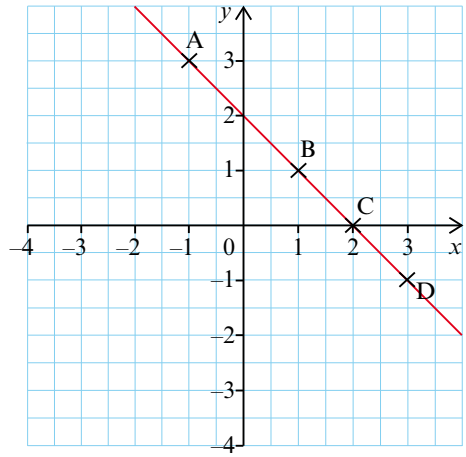


a Copy the coordinate table.
Use the four points to complete it.

Point	x	y
A	0	3
B		
C		
D		

b At each point, the x-coordinate and y-coordinate add up to the same value.
Write the equation of the line. $x + y =$ □

10 The graph shows four points on a straight line.



a Copy the coordinate table.
Use the four points to complete it.

Point	x	y
A	−1	3
B		
C		
D		

b At each point, the x-coordinate and y-coordinate add up to the same value.

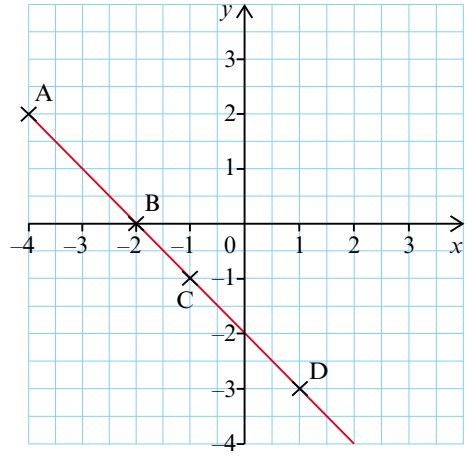
Write the equation of the line. $x + y = \square$

c **i** The x-coordinate of a point on the line is 4.

What is the y-coordinate? Explain how you know.

ii Write the coordinates of the point where this line crosses the line $x = 4$.

11 The graph shows four points on a straight line.



a Copy the coordinate table.
Use the four points to complete it.

Point	x	y
A	−4	2
B		
C		
D		

b At each point, the x-coordinate and y-coordinate add up to the same value.

Write the equation of the line. $x + y = \square$

c **i** The y-coordinate of a point on the line is 1.

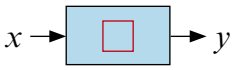
What is the x-coordinate? Explain how you know.

ii Write the coordinates of the point where this line crosses the line $y = 1$.

explanation 4

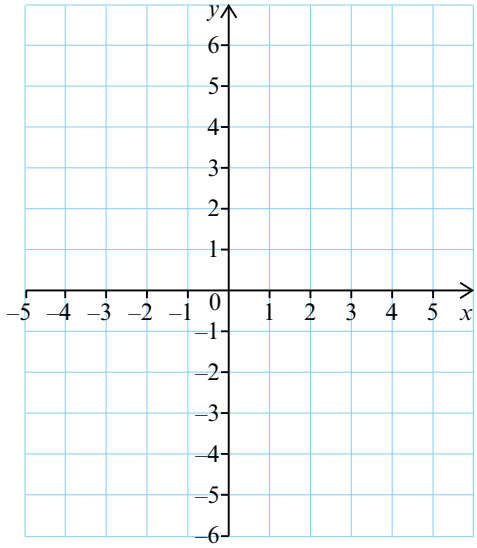
12 This question is about the line with equation $y = x + 3$.

a Copy and complete the function machine.



b Copy the table. Use the function machine to complete it.

Point	x	y
A	−1	
B	0	
C	1	
D	2	

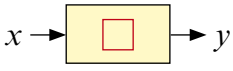


c Copy the axes and plot the points from your table.

d Draw a line through your points to the edge of the grid and label it with its equation.

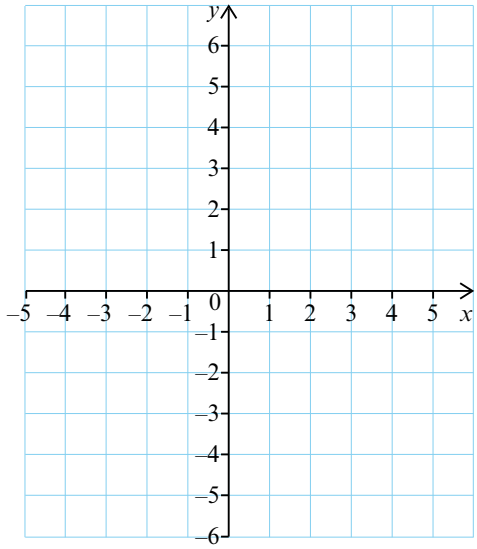
13 This question is about the line with equation $y = x - 2$.

a Copy and complete the function machine.



b Copy the table. Use the function machine to complete it.

Point	x	y
A	−2	
B	0	
C	2	
D	4	



c Copy the axes and plot the points from your table.

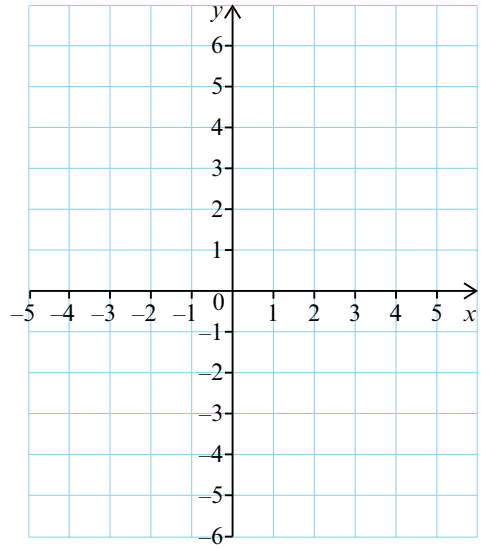
d Draw a line through your points to the edge of the grid and label it with its equation.

14 Repeat question **12** for the line with equation $y = 2x$.

15 Repeat question **12** for the line with equation $y = 3x$.

explanation 5

16 For each point on the line with equation $x + y = 5$, the x-coordinate and the y-coordinate always add up to 5.



a Copy and complete the table.

Point	x	y
A	−1	
B	0	
C	1	
D	2	

b Copy the axes. Plot the points from your table.

c Draw a line through your points to the edge of the grid. Label it with its equation.

17 Repeat question **16** for the line with equation $x + y = 4$.

18 Repeat question **16** for the line with equation $x + y = 1$.

19 **a** Look at the lines that you drew in questions **16** to **18**.

What do all three lines have in common?

b What do you notice about the values where the lines cross the x-axis and y-axis?