

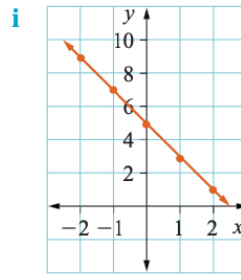
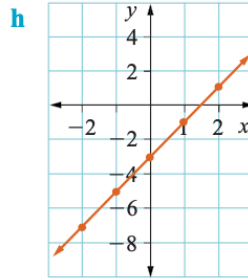
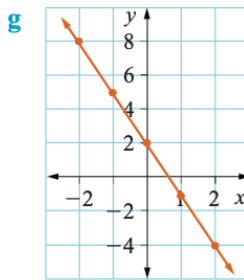
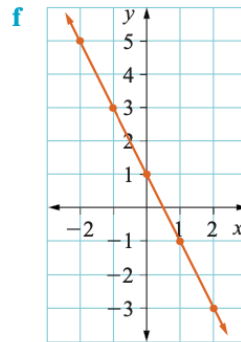
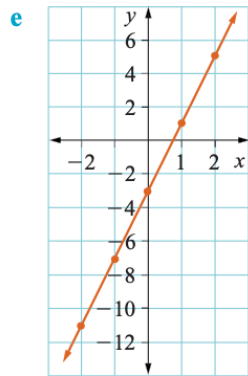
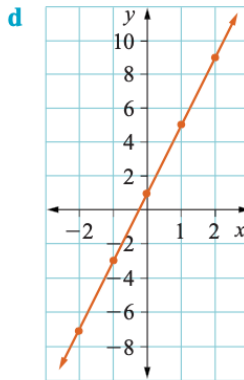
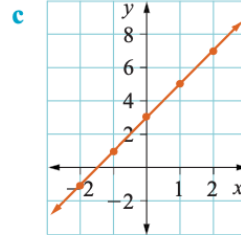
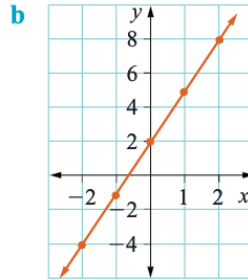
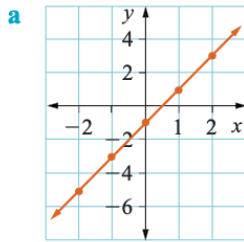
**Walt** complete the table to values by viewing a graph

**Success criteria** I can identify coordinates and the y-intercept. The rate of increase is the value that can guide me to the equation.

9

**6** Complete a table of values and find the equation of each of these lines.

This may be completed using a graphics calculator. ! .....



Extension

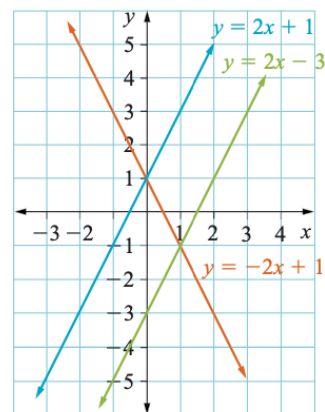
## Investigation 2 Linear relationships

- 1 a Using a 0.5 cm grid, draw these graphs on the same number plane.  
 $y = 3x + 1$ ,  $y = 3x - 1$ ,  $y = 3x$ ,  $y = 3x + 2$ 
  - b What do you notice about all four graphs? Explain.
  - c Without plotting points, add the graph of  $y = 3x + 3$  to your number plane in part a. Explain how you knew what to draw.
- 2 a On the number plane from question 1, draw these graphs.  
 $y = 2x + 1$ ,  $y = 3x + 1$ ,  $y = x + 1$ 
  - b What do you notice about all three graphs? Explain.
  - c Without plotting points, add the graph of  $y = 4x + 1$  to your number plane. Explain how you knew what to draw.
- 3 a On another number plane draw the graphs of  $y = x + 1$ ,  $y = -x + 1$ .
  - b What do you notice about these two graphs? Explain.
  - c On a second number plane draw graphs of  $y = x$  and  $y = -x$ .
  - d What do you notice about these two graphs? Explain.
  - e On a third number plane draw graphs of  $y = 2x + 1$  and  $y = -2x + 1$ .
  - f What do you notice about these two graphs? Explain.
  - g How can you decide if a graph is increasing or decreasing based on the equation?

In Investigation 2 you found the following properties of straight-line graphs.

- 1 If the coefficient of  $x$  is the same in each equation, the lines are parallel.  
 For example,  $y = 2x + 1$  and  $y = 2x - 3$  are parallel.
- 2 The constant term (the term without  $x$ ) is where the line cuts the  $y$ -axis.  
 For example,  $y = -2x + 1$  cuts the  $y$ -axis at  $y = 1$ . This is the  $y$ -intercept.
- 3 Lines with the coefficient of  $x$  equal but opposite in sign have the same slope but in opposite directions.
- 4 As we move from left to right, lines with a positive coefficient of  $x$  have an 'uphill' slope. Lines with a negative coefficient of  $x$  have a 'downhill' slope.

The coefficient of  $x$  is the number in front of the  $x$ . !.....



Check your answers

**6 a**  $y = 2x - 1$

$x$	-2	-1	0	1	2
$y$	-5	-3	-1	1	3

**b**  $y = 3x + 2$

$x$	-2	-1	0	1	2
$y$	-4	-1	2	5	8

**c**  $y = 2x + 3$

$x$	-2	-1	0	1	2
$y$	-1	1	3	5	7

**d**  $y = 4x + 1$

$x$	-2	-1	0	1	2
$y$	-7	-3	1	5	9

**e**  $y = 4x - 3$

$x$	-2	-1	0	1	2
$y$	-11	-7	-3	1	5

**f**  $y = -2x + 1$

$x$	-2	-1	0	1	2
$y$	5	3	1	-1	-3

**g**  $y = -3x + 2$

$x$	-2	-1	0	1	2
$y$	8	5	2	-1	-4

**h**  $y = 2x - 3$

$x$	-2	-1	0	1	2
$y$	-7	-5	-3	-1	1

**i**  $y = -2x + 5$

$x$	-2	-1	0	1	2
$y$	9	7	5	3	1