

Monday 17th August 20

Walt complete the table to values by viewing a graph

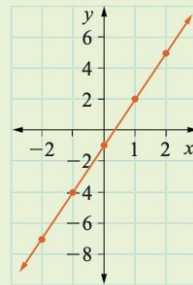
Success criteria I can identify coordinates and the y-intercept. The rate of increase is the value that can guide me to the equation.

EXAMPLE 3

This graph shows a straight line.

a Use the graph to complete this table of values.

x	-2	-1	0	1	2
y					



The symbol \pm means plus or minus. !

b Write the rule describing this straight line.

The rule is of the form $y = \square x \pm \triangle$.

a The table of values is completed from the graph.

b As x increases by 1, y increases by 3. This means that $y = 3x$ is part of the equation of the line.

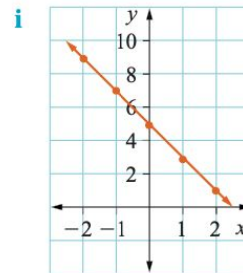
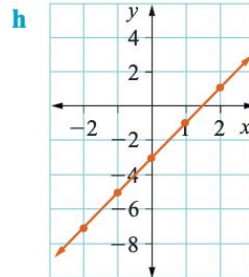
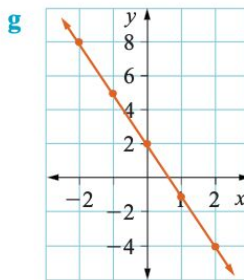
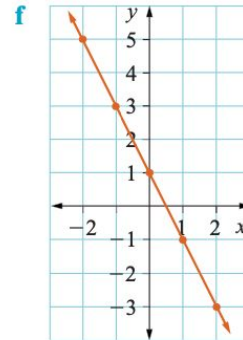
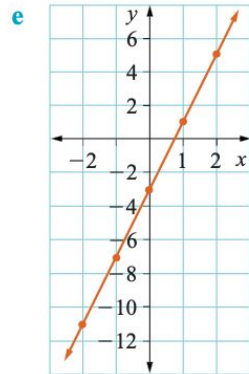
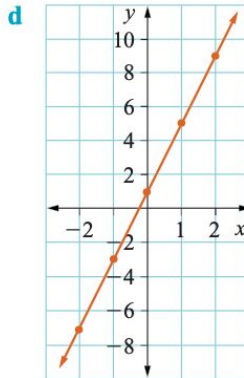
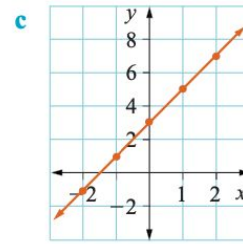
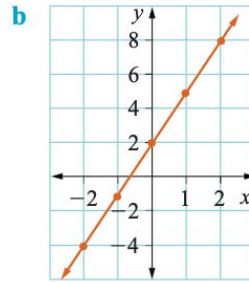
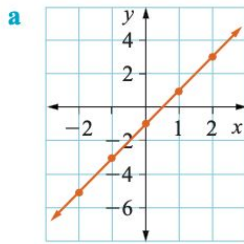
When $x = 0$, $y = -1$, so the equation is $y = 3x - 1$.

To check, test another point. Test $(2, 5)$: $5 = 3(2) - 1 = 5 \quad \therefore$ The equation is correct.

x	-2	-1	0	1	2
y	-7	-4	-1	2	5

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.

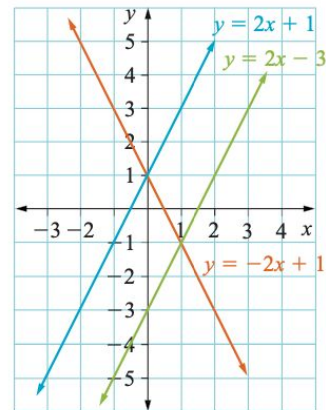
- 2 The constant term (the term without x) is where the line cuts the y -axis.

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