Monday 17th Agust 20

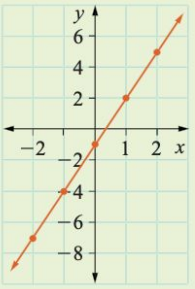
Walt complete the table to values by viewing a graph
Success criteria I can identify coordinates and the y-intercept. The rate of increase is the value that can guide me to the equation.

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					



b Write the rule describing this straight line.
The rule is of the form $y = \square x \pm \triangle$.

The symbol ± means plus or minus.

a The table of values is completed from the graph.

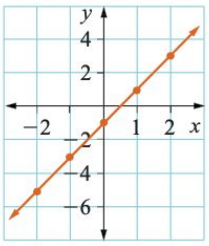
x	-2	-1	0	1	2
y	-7	-4	-1	2	5

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): $5 = 3(2) - 1 = 5$ $\therefore$ The equation is correct.

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

This may be completed using a graphics calculator.

a



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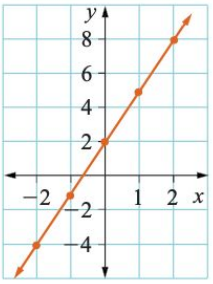

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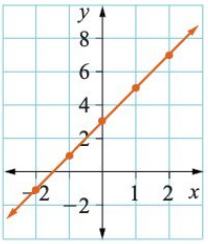

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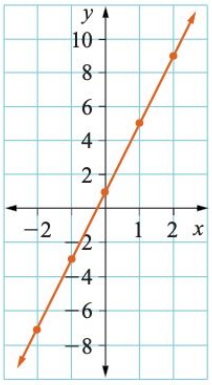

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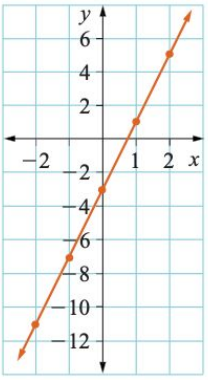

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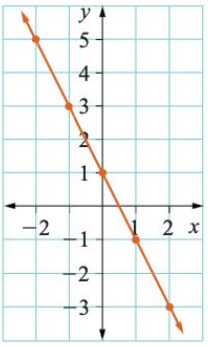

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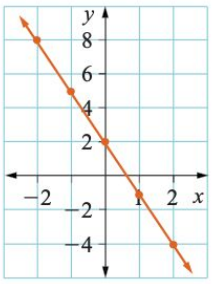

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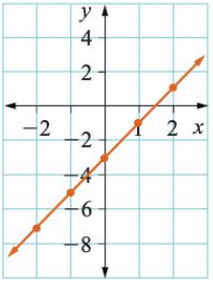

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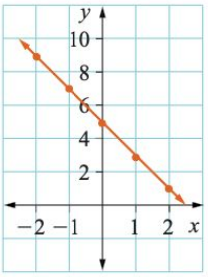


Extension

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.

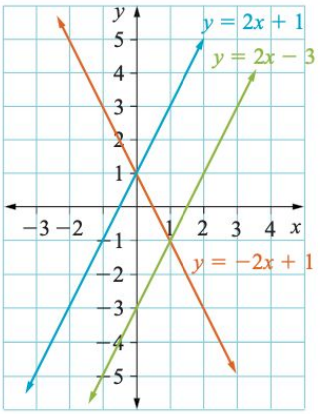
The coefficient of x is the number in front of the x.

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.



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