

GCSE MATHS • GRADE 3

MATHS



MODEL ANSWERS

LINEAR GRAPHS

SCORE

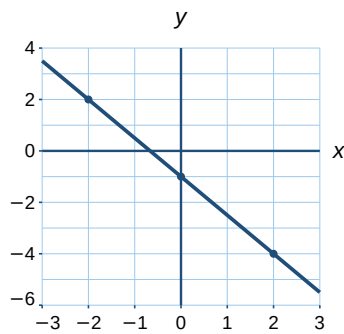
/92

PERCENTAGE

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STEM UP

- 1 The graph of $y = -\frac{3}{2}x - 1$ is drawn on the grid.
Use the graph to find the value of y when $x = 1$.



Read up from $x = 1$ to the line, then across to the y axis

-2.5

/ 1

- 2 Complete the table of values for $y = 2x - 1$.

x	-2	-1	0	1	2	3	4
y	.....	-3	-1	.....	3	.....	7

$x = -2: y = -5$

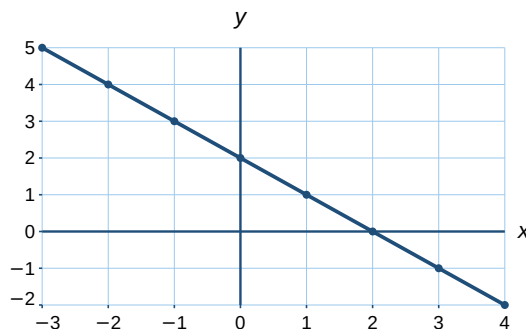
$x = 1: y = 1$

$x = 3: y = 5$

-5, 1, 5

/ 1

- 3 A straight line is drawn on the grid.
Write down the y -intercept of the line.

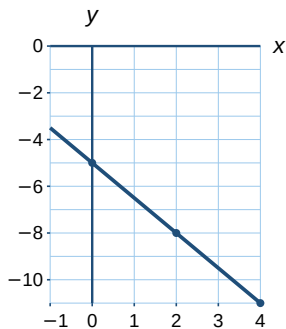


The line crosses the y axis at (0, 2)

2

/ 1

- 4 The graph of $y = -\frac{3}{2}x - 5$ is drawn on the grid.
Use the graph to find the value of y when $x = 4$.



Read up from $x = 4$ to the line, then across to the y axis

-11

/ 1

- 5 A line has gradient -1 and crosses the y axis at $(0, 2)$.
Write down the equation of the line.

$y = mx + c$ with $m = -1$ and $c = 2$

$y = -x + 2$

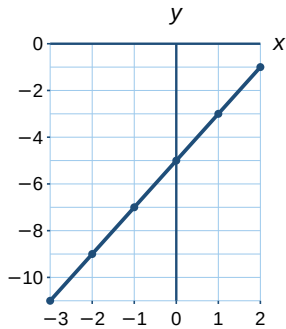
/ 1

- 6 Write down the coordinates of the point where the line $y = -x - 4$ crosses the y axis.
 $x = 0$ gives $y = -4$

$(0, -4)$

/ 1

- 7 A straight line is drawn on the grid.
Use the graph to find the value of y when $x = -2$.



Read up from $x = -2$ to the line, then across to the y axis

-9

/ 1

- 8 A line has gradient -2 and crosses the y axis at $(0, 4)$.
Write down the equation of the line.

$y = mx + c$ with $m = -2$ and $c = 4$

$y = -2x + 4$

/ 1

- 9 Complete the table of values for $y = -\frac{1}{2}x$.

x	-1	0	1	2	3	4
y	0.5	.....	-0.5	.....	.....	-2

$x = 0: y = 0$

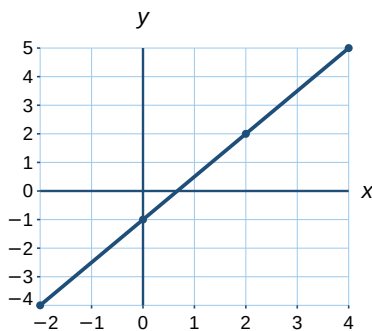
$x = 2: y = -1$

$x = 3: y = -1.5$

0, -1, -1.5

/ 1

- 10 The graph of $y = \frac{3}{2}x - 1$ is drawn on the grid.
Use the graph to find the value of y when $x = 3$.



Read up from $x = 3$ to the line, then across to the y axis

3.5

/ 1

- 11 A line has gradient -2 and crosses the y axis at $(0, 2)$.
Write down the equation of the line.

$y = mx + c$ with $m = -2$ and $c = 2$

$y = -2x + 2$

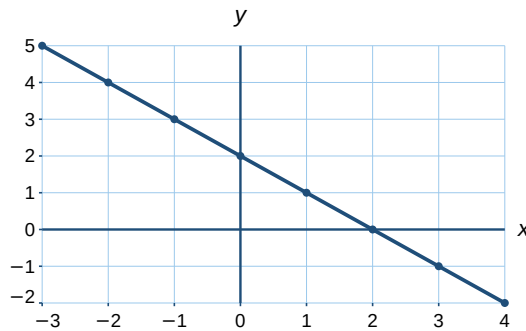
/ 1

- 12 Write down the coordinates of the point where the line $y = -2x - 2$ crosses the y axis.
 $x = 0$ gives $y = -2$

$(0, -2)$

/ 1

- 13 A straight line is drawn on the grid.
Use the graph to find the value of y when $x = 4$.



*Read up from $x = 4$ to the line,
then across to the y axis*

-2

/ 1

- 14 Write down the gradient and the y -intercept of the line $y = -4 - \frac{3}{2}x$.

Compare with $y = mx + c$: $m = -1.5$ and $c = -4$

Gradient $-\frac{3}{2}$, y -intercept -4

/ 1

- 15 On the grid, draw the graph of $y = -3x + 3$ for values of x from 0 to 4.

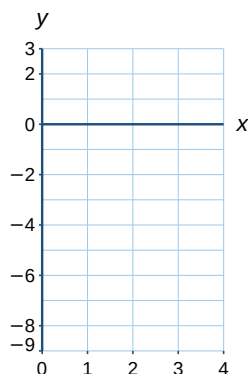


Table of values: $x = 0$: $y = 3$

$x = 1$: $y = 0$

$x = 2$: $y = -3$

$x = 3$: $y = -6$

$x = 4$: $y = -9$

Straight line through $(0, 3)$, $(4, -9)$ and $(0, 3)$

/ 1

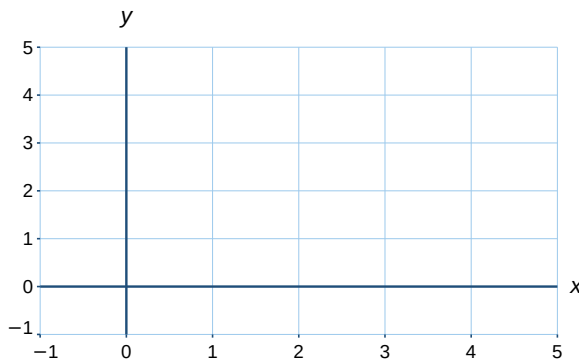
- 16 Work out the gradient of the straight line that passes through the points (1, 4) and (5, 8).

$$(8 - 4) \div (5 - 1) = 4 \div 4$$

1

1 / 1

- 17 On the grid, draw the graph of $x + y = 4$ for values of x from -1 to 5 .



$$y = 4 - x: x = -1 \text{ gives } y = 5$$

$$x = 5 \text{ gives } y = -1$$

Straight line through $(-1, 5)$, $(0, 4)$, $(4, 0)$ and $(5, -1)$

1 / 1

- 18 On the grid, draw the graph of $y = 2x + 5$ for values of x from -3 to 3 .

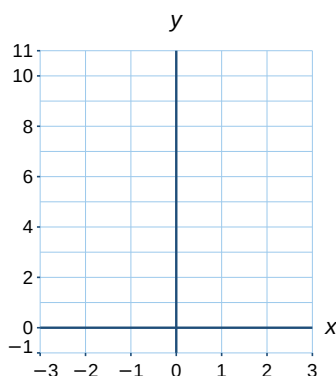


Table of values: $x = -3: y = -1$

$$x = -2: y = 1$$

$$x = -1: y = 3$$

$$x = 0: y = 5$$

$$x = 1: y = 7$$

$$x = 2: y = 9$$

$$x = 3: y = 11$$

Straight line through $(-3, -1)$, $(3, 11)$ and $(0, 5)$

1 / 1

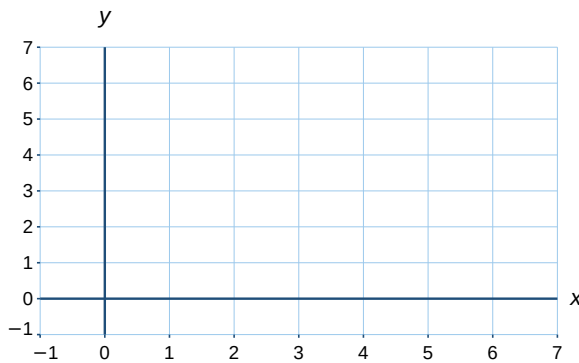
- 19 Work out the gradient of the straight line that passes through the points $(-1, -4)$ and $(0, -3)$.

$$(-3 - (-4)) \div (0 - (-1)) = 1 \div 1$$

1

1 / 1

- 20 On the grid, draw the graph of $x + y = 6$ for values of x from -1 to 7 .



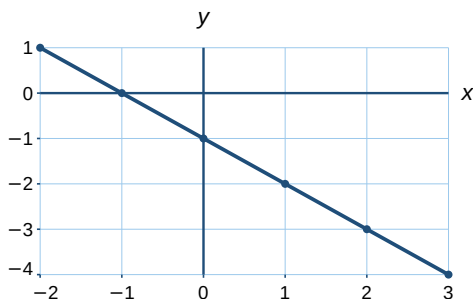
$$y = 6 - x: x = -1 \text{ gives } y = 7$$

$$x = 7 \text{ gives } y = -1$$

Straight line through $(-1, 7)$, $(0, 6)$, $(6, 0)$ and $(7, -1)$

1 / 1

- 21 The graph of $y = -x - 1$ is drawn on the grid.
Use the graph to find the value of y when $x = -0.5$.



$$y = -1 \times -0.5 - 1 = -0.5$$

-0.5

2 / 2

- 22 Work out the gradient of the straight line that passes through the points $(-3, -5)$ and $(1, 3)$.

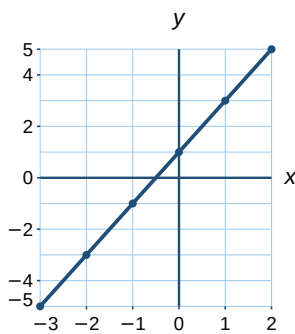
$$(3 - (-5)) \div (1 - (-3)) = 8 \div 4$$

2

2 / 2

- 23 A straight line is drawn on the grid.

Work out the gradient of the line.



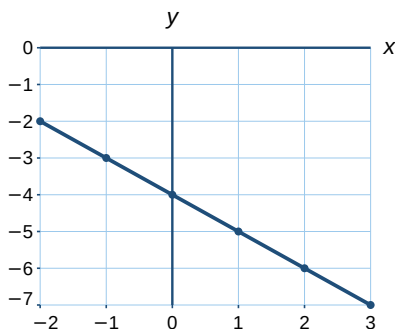
Using $(-3, -5)$ and $(2, 5)$: change in $y \div$ change in $x = 10 \div 5$

2

2 / 2

- 24 The graph of $y = -x - 4$ is drawn on the grid.

Use the graph to find the value of y when $x = 2.5$.



$$y = -1 \times 2.5 - 4 = -6.5$$

-6.5

2 / 2

- 25 On the grid, draw the graph of $y = \frac{1}{2}x - 2$ for values of x from 0 to 2.

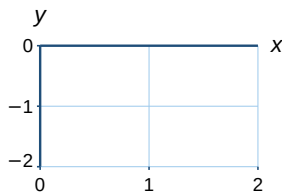


Table of values: $x = 0: y = -2$

$x = 1: y = -1.5$

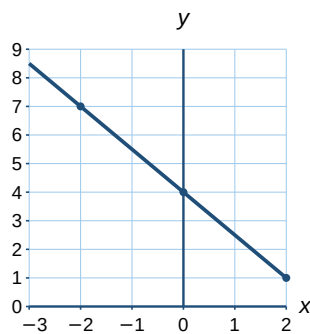
$x = 2: y = -1$

Straight line through $(0, -2)$,
 $(2, -1)$ and $(0, -2)$

2 / 2

- 26 A straight line is drawn on the grid.

Work out the gradient of the line.



Using $(-2, 7)$ and $(2, 1)$: change in $y \div$ change
in $x = -6 \div 4$

$-\frac{3}{2}$

2 / 2

- 27 Does the point $(5, 19)$ lie on the line $y = 3x + 3$?

You must show your working.

When $x = 5: y = 18$, so the point is not on the
line

No

2 / 2

- 28 On the grid, draw the graph of $y = -\frac{1}{2}x + 3$ for values of x from -2 to 3 .

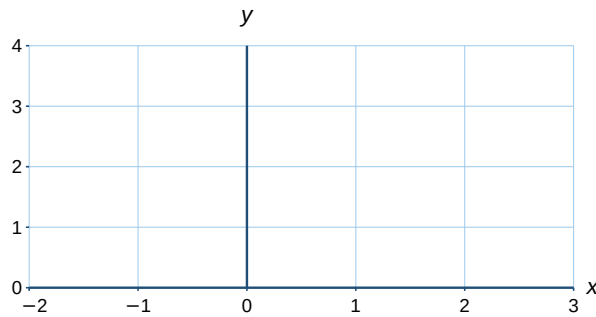


Table of values: $x = -2$: $y = 4$

$x = -1$: $y = 3.5$

$x = 0$: $y = 3$

$x = 1$: $y = 2.5$

$x = 2$: $y = 2$

$x = 3$: $y = 1.5$

Straight line through $(-2, 4)$,
 $(3, 1.5)$ and $(0, 3)$

2 / 2

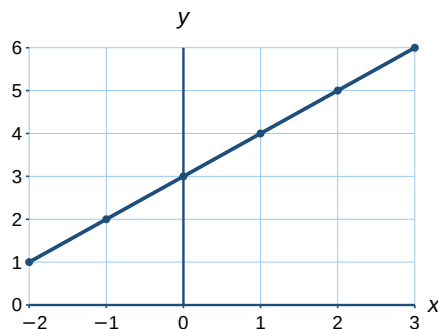
- 29 Write down the coordinates of the point where the line $y = x - 5$ crosses the x axis.

$y = 0$: $0 = x - 5$ so $x = 5$

$(5, 0)$

2 / 2

- 30 A straight line is drawn on the grid.
Find the equation of the line.



Gradient = 1, y -intercept = 3

$y = x + 3$

2 / 2

- 31 On the grid, draw the graph of $y = \frac{3}{2}x - 4$ for values of x from -2 to 4 .

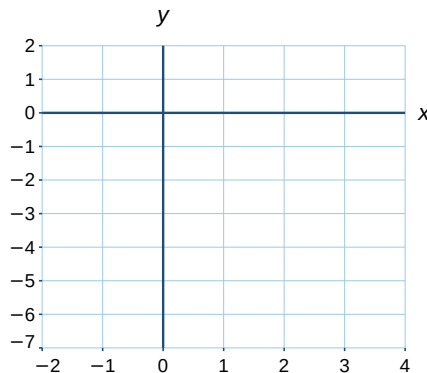


Table of values: $x = -2: y = -7$

$x = -1: y = -5.5$

$x = 0: y = -4$

$x = 1: y = -2.5$

$x = 2: y = -1$

$x = 3: y = 0.5$

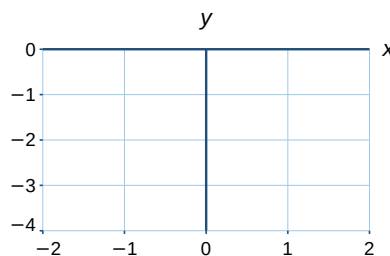
$x = 4: y = 2$

Straight line through $(-2, -7)$,
 $(4, 2)$ and $(0, -4)$

2 / 2

- 32 (a) Complete the table of values for $y = x - 2$.
(b) On the grid, draw the graph of $y = x - 2$ for values of x from -2 to 2 .

x	y
-2	.....
-1	.....
0	.....
1	-1
2	0



(a) $x = -2$ gives $y = -4$

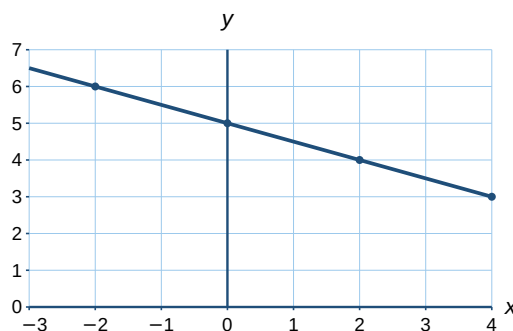
$x = -1$ gives $y = -3$

$x = 0$ gives $y = -2$

(a) $-4, -3, -2$; (b) straight
line through $(-2, -4), (2, 0)$

2 / 2

- 33 A straight line is drawn on the grid.
Find the equation of the line.

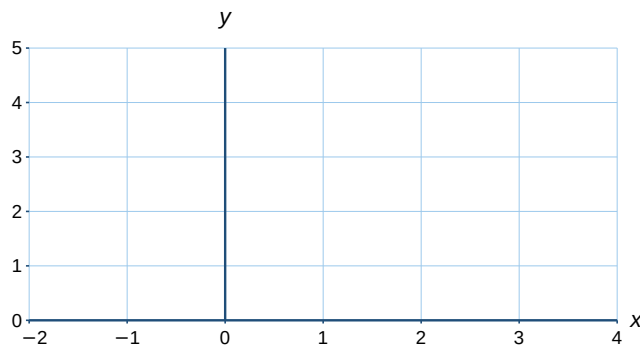


Gradient = -0.5 , y -intercept = 5

$$y = -\frac{1}{2}x + 5$$

2 / 2

- 34 (a) On the grid, draw the graph of $y = \frac{1}{2}x + 3$ for values of x from -2 to 4 .
 (b) Use your graph to find the value of x when $y = 4.1$.



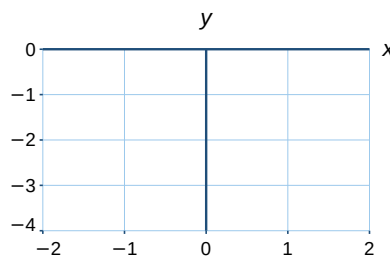
(b) Read across from $y = 4.1$ to the line, then down to the x axis

(a) straight line through $(-2, 2)$ and $(4, 5)$; (b) $x = 2.2$

2 / 2

- 35 (a) Complete the table of values for $y = x - 2$.
 (b) On the grid, draw the graph of $y = x - 2$ for values of x from -2 to 2 .

x	y
-2	-4
-1	.....
0	-2
1	.....
2	.....



(a) $x = -1$ gives $y = -3$
 $x = 1$ gives $y = -1$
 $x = 2$ gives $y = 0$

(a) $-3, -1, 0$; (b) straight line through $(-2, -4), (2, 0)$

2 / 2

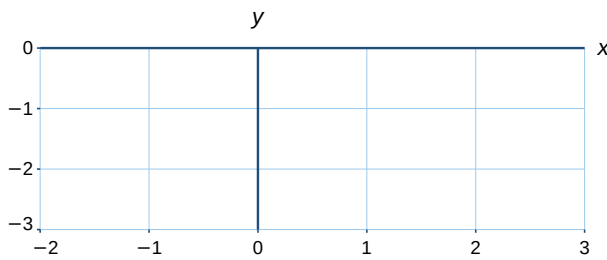
- 36 A line has the equation $y = 4x - 5$.
 Write down the gradient of a line that is perpendicular to this line.

Perpendicular gradients multiply to give -1 : $4 \times -0.25 = -1$

$-\frac{1}{4}$

2 / 2

- 37 (a) On the grid, draw the graph of $y = \frac{1}{2}x - 2$ for values of x from -2 to 3 .
 (b) Use your graph to find the value of x when $y = -1.3$.



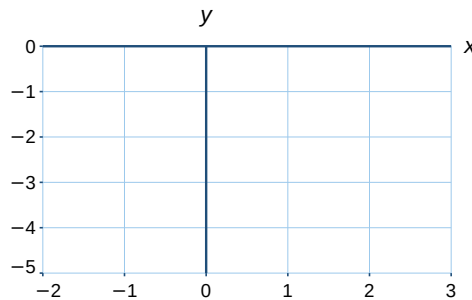
(b) Read across from $y = -1.3$ to the line, then down to the x axis

(a) straight line through $(-2, -3)$ and $(3, -0.5)$; (b) $x = 1.4$

2 / 2

- 38 (a) Complete the table of values for $y = -x - 2$.
 (b) On the grid, draw the graph of $y = -x - 2$ for values of x from -2 to 3 .

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



(a) $x = -1$ gives $y = -1$
 $x = 0$ gives $y = -2$
 $x = 2$ gives $y = -4$

(a) $-1, -2, -4$; (b) straight line through $(-2, 0), (3, -5)$

2 / 2

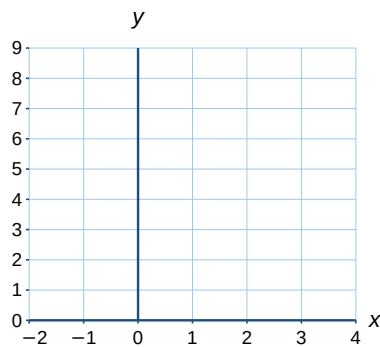
- 39 A line is parallel to $y = 2x - 1$.
 The line passes through the point $(-1, -1)$.
 Find the equation of the line.

Parallel lines have the same gradient 2
 substitute $(-1, -1)$ to find $c = 1$

$$y = 2x + 1$$

3 / 3

- 40 (a) On the grid, draw the graph of $y = \frac{3}{2}x + 3$ for values of x from -2 to 4 .
 (b) Use your graph to find the value of x when $y = 5.4$.



(b) Read across from $y = 5.4$ to the line, then down to the x axis

(a) straight line through $(-2, 0)$ and $(4, 9)$; (b) $x = 1.6$

3 / 3

- 41 A straight line passes through the points $(-1, 1)$ and $(1, 3)$.
 Find the equation of the line.

Gradient = $(3 - 1) \div (1 - (-1)) = 1$
 then $y = 1x + c$ through $(-1, 1)$ gives $c = 2$

$y = x + 2$

3 / 3

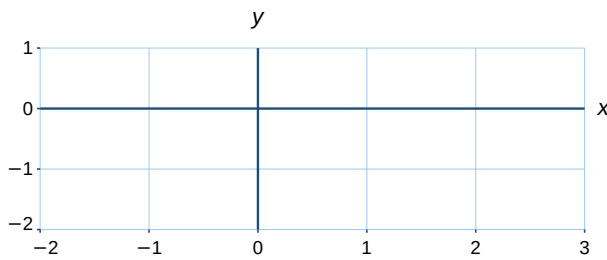
- 42 A line is parallel to $y = -x + 4$.
 The line passes through the point $(-1, 2)$.
 Find the equation of the line.

Parallel lines have the same gradient -1
 substitute $(-1, 2)$ to find $c = 1$

$y = -x + 1$

3 / 3

- 43 (a) On the grid, draw the graph of $y = -\frac{1}{2}x$ for values of x from -2 to 3 .
 (b) Use your graph to find the value of x when $y = -1.2$.



(b) Read across from $y = -1.2$ to the line, then down to the x axis

(a) straight line through $(-2, 1)$ and $(3, -1.5)$; (b) $x = 2.4$

3 / 3

- 44 A straight line passes through the points $(2, -3)$ and $(3, -4)$.
 Find the equation of the line.

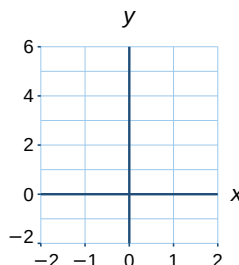
Gradient $= (-4 - (-3)) \div (3 - 2) = -1$
 then $y = -x + c$ through $(2, -3)$ gives $c = -1$

$$y = -x - 1$$

3 / 3

- 45 (a) Complete the table of values for $y = 2x + 2$.
 (b) On the grid, draw the graph of $y = 2x + 2$ for values of x from -2 to 2 .
 (c) Use your graph to find the value of y when $x = 0.4$.

x	y
-2	.....
-1	.....
0	2
1	4
2	.....



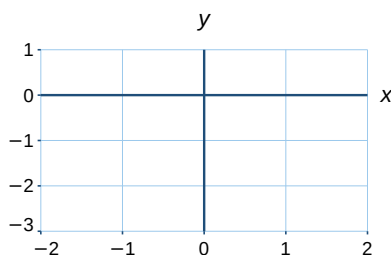
(a) $x = -2$ gives $y = -2$
 $x = -1$ gives $y = 0$
 $x = 2$ gives $y = 6$
 (c) $2 \times 0.4 + 2 = 2.8$

(a) $-2, 0, 6$; (b) straight line through $(-2, -2), (2, 6)$; (c) $y = 2.8$

3 / 3

- 46 (a) Complete the table of values for $y = x - 1$.
 (b) On the grid, draw the graph of $y = x - 1$ for values of x from -2 to 2 .
 (c) Use your graph to find the value of y when $x = -0.8$.

x	y
-2	-3
-1	.....
0	-1
1	.....
2	.....



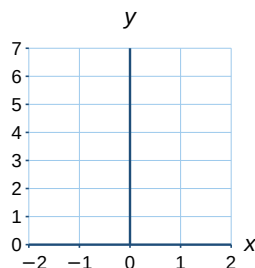
(a) $x = -1$ gives $y = -2$
 $x = 1$ gives $y = 0$
 $x = 2$ gives $y = 1$
 (c) $1 \times -0.8 - 1 = -1.8$

(a) $-2, 0, 1$; (b) straight line through $(-2, -3), (2, 1)$; (c) $y = -1.8$

3 / 3

- 47 (a) Complete the table of values for $y = -x + 5$.
 (b) On the grid, draw the graph of $y = -x + 5$ for values of x from -2 to 2 .
 (c) Use your graph to find the value of y when $x = 0.8$.

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



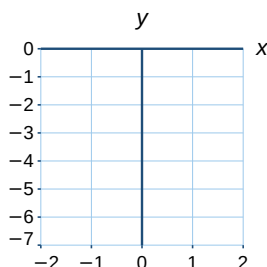
(a) $x = -2$ gives $y = 7$
 $x = -1$ gives $y = 6$
 $x = 2$ gives $y = 3$
 (c) $-1 \times 0.8 + 5 = 4.2$

(a) $7, 6, 3$; (b) straight line through $(-2, 7), (2, 3)$; (c) $y = 4.2$

3 / 3

- 48 (a) Complete the table of values for $y = x - 5$.
 (b) On the grid, draw the graph of $y = x - 5$ for values of x from -2 to 2 .
 (c) Use your graph to find the value of y when $x = -0.8$.

x	y
-2	.....
-1	-6
0	.....
1	-4
2	.....



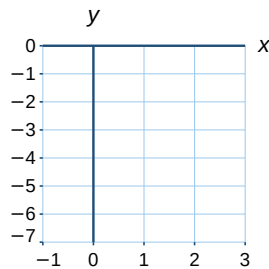
(a) $x = -2$ gives $y = -7$
 $x = 0$ gives $y = -5$
 $x = 2$ gives $y = -3$
 (c) $1 \times -0.8 - 5 = -5.8$

(a) $-7, -5, -3$; (b) straight line through $(-2, -7), (2, -3)$; (c) $y = -5.8$

3 / 3

- 49 (a) Complete the table of values for $y = -4 - x$.
 (b) On the grid, draw the graph of $y = -4 - x$ for values of x from -1 to 3 .
 (c) Use your graph to find the value of y when $x = 0.4$.

x	y
-1	.....
0	.....
1	-5
2	-6
3	.....



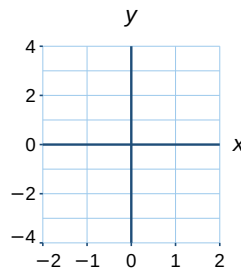
(a) $x = -1$ gives $y = -3$
 $x = 0$ gives $y = -4$
 $x = 3$ gives $y = -7$
 (c) $-1 \times 0.4 - 4 = -4.4$

(a) $-3, -4, -7$; (b) straight line through $(-1, -3), (3, -7)$; (c) $y = -4.4$

3 / 3

- 50 (a) Complete the table of values for $y = 2x$.
 (b) On the grid, draw the graph of $y = 2x$ for values of x from -2 to 2 .
 (c) Use your graph to find the value of y when $x = -0.4$.

x	y
-2	.....
-1	.....
0	.....
1	2
2	4



(a) $x = -2$ gives $y = -4$
 $x = -1$ gives $y = -2$
 $x = 0$ gives $y = 0$
 (c) $2 \times -0.4 + 0 = -0.8$

(a) $-4, -2, 0$; (b) straight line through $(-2, -4), (2, 4)$; (c) $y = -0.8$

3 / 3