We have learnt so far how straight-line graphs could be used to model practical situations. The graphs were used to answer questions. This time we will be learning how straight-line graphs can be used with practical application. These graphs will be drawn from tables of values

WALT draw straight Line graph from the given formula
Success Criteria Calculate Values for x and y coordinates
Cartesian plane explained

EXAMPLE 1

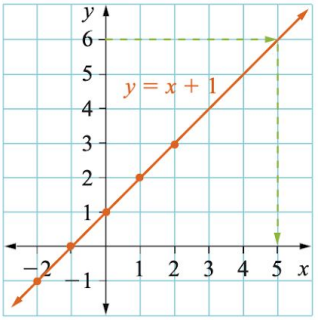
a Complete the table of values for $y = x + 1$.
b Draw the graph of $y = x + 1$.
c Use the graph to solve $x + 1 = 6$.

x	-2	-1	0	1	2
y					

a When $x = -2, y = -2 + 1 = -1$
When $x = 0, y = 0 + 1 = 1$
When $x = 2, y = 2 + 1 = 3$
When $x = -1, y = -1 + 1 = 0$
When $x = 1, y = 1 + 1 = 2$
Use these values to complete the table.

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

Write the equation on the graph.



b Plot these points. Draw a straight line through the points, extending the line past the points to give the graph of $y = x + 1$.
c Draw a line from $y = 6$ across to the graph then down to the x-axis. The x-value is 5; that is, $x = 5$ is the solution to $x + 1 = 6$.

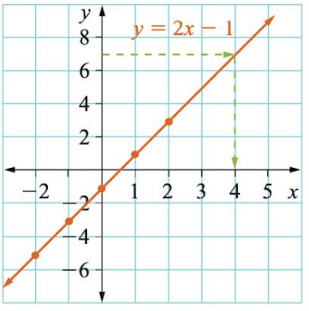
EXAMPLE 2

a Complete the table of values for $y = 2x - 1$.
b Draw the graph of $y = 2x - 1$.
c Use the graph to solve $2x - 1 = 7$.

x	-2	-1	0	1	2
y					

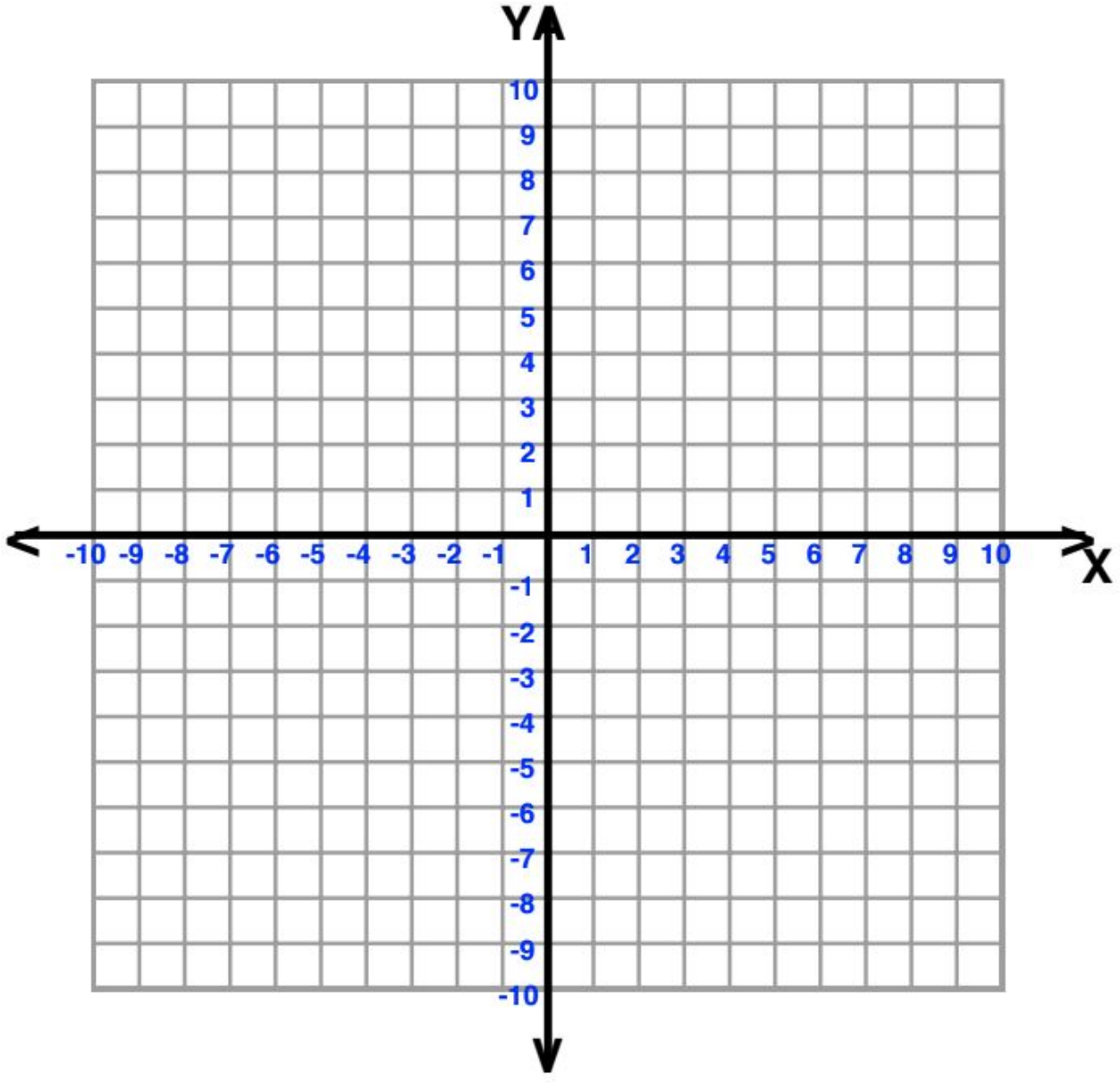
a When $x = -2, y = 2(-2) - 1 = -5$
When $x = 0, y = 2(0) - 1 = -1$
When $x = 2, y = 2(2) - 1 = 3$
When $x = -1, y = 2(-1) - 1 = -3$
When $x = 1, y = 2(1) - 1 = 1$
Use these values to complete the table.

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



b Plotting these points. Draw a straight line through the points, extending the line past the points to give the graph of $y = 2x - 1$.
c Draw a line from $y = 7$ across to the graph then down to the x-axis. The x-value is 4; that is, $x = 4$ is the solution to $2x - 1 = 7$.

- The graph must have a heading or the equation of the line.
- The x and y axes must be labelled.
- The points are plotted and the line drawn through them.
- Arrows on each end of the line show that it extends in both directions.
- Any value may be chosen for x and the corresponding y-value calculated.



Complete the given task

WALT use a rule for y= mx+c and substitute values

Success Criteria I can assume numbers for x value and substitute them to find the values for y

1 **a** Complete the table and draw the graph $y = 2x + 1$.
Some of the points are provided.

x	-2	-1	0	1	2
y		-1			5

b Use the graph to solve $2x + 1 = 7$.

2 **a** Complete the table and draw the graph $y = 3x - 2$.
Some of the points are provided.

x	-2	-1	0	1	2
y	-8			1	

b Use the graph to solve $3x - 2 = 7$.

3 **a** Complete the table and draw the graph $y = 2x - 3$.
Some of the points are provided.

x	-2	-1	0	1	2
y		-5			1

b Use the graph to solve $2x - 3 = 4$.

4 Use a table to draw the graphs of the following equations.

a $y = x - 2$ **b** $y = x + 4$ **c** $y = 2x + 4$
d $y = -3x + 2$ **e** $y = -x + 4$ **f** $y = 2x$
g $y = -4x + 3$ **h** $y = \frac{1}{2}x + 1$ **i** $y = 3 - x$

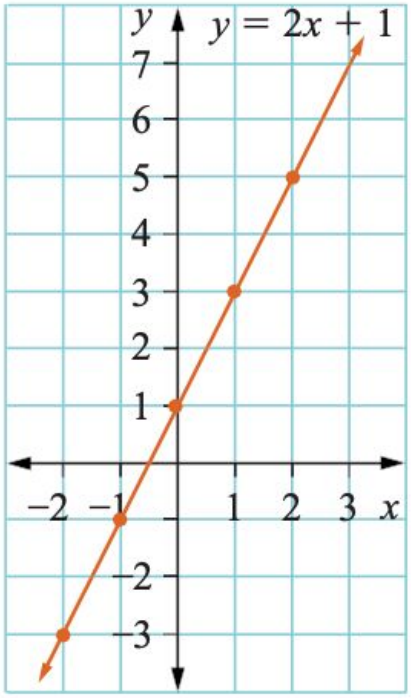
5 Use the graphs from question **4** to solve these equations.

a $x - 2 = 2$ **b** $x + 4 = 8$ **c** $2x + 4 = -4$
d $-3x + 2 = -10$ **e** $-x + 4 = 7$ **f** $2x = 7$
g $-4x + 3 = 5$ **h** $\frac{1}{2}x + 1 = -1$ **i** $3 - x = -1$

Check your answers

1 a

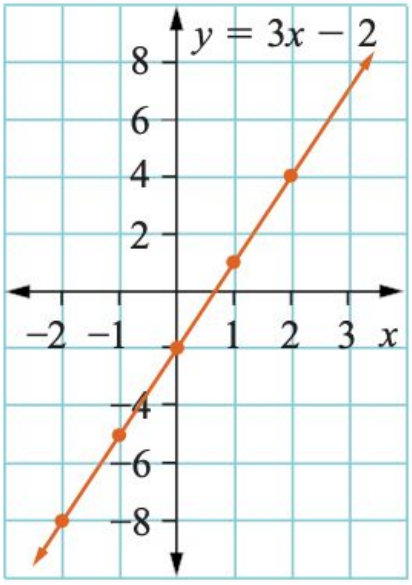
x	-2	-1	0	1	2
y	-3	-1	1	3	5



b $x = 3$

2 a

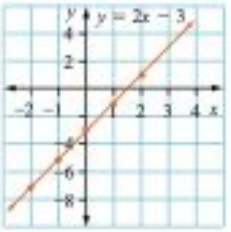
x	-2	-1	0	1	2
y	-8	-5	-2	1	4



b $x = 3$

3 a

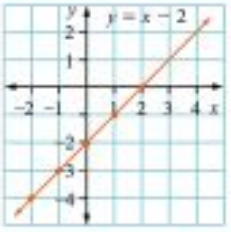
x	−2	−1	0	1	2
y	−7	−5	−3	−1	1



b $y = 3\frac{1}{2}$

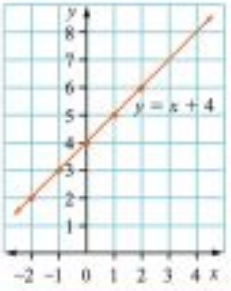
4 a

x	−2	−1	0	1	2
y	−4	−3	−2	−1	0



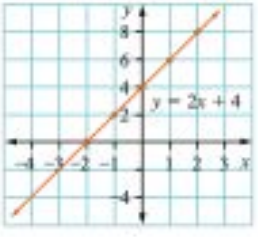
b

x	−2	−1	0	1	2
y	2	3	4	5	6



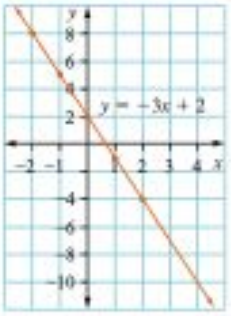
c

x	−2	−1	0	1	2
y	0	2	4	6	8



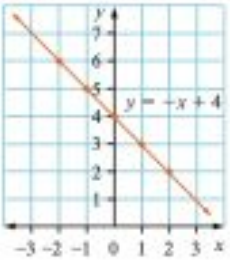
d

x	−2	−1	0	1	2
y	8	5	2	−1	−4



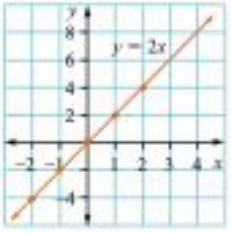
e

x	−2	−1	0	1	2
y	6	5	4	3	2



f

x	−2	−1	0	1	2
y	−4	−2	0	2	4

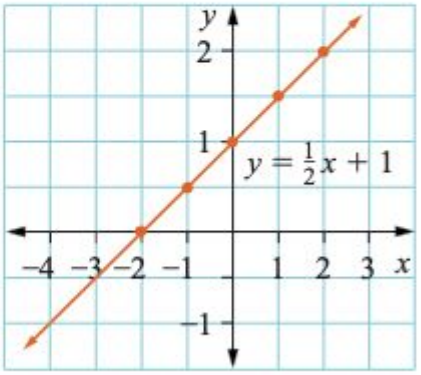


g

x	−2	−1	0	1	2
y	11	7	3	−1	−5

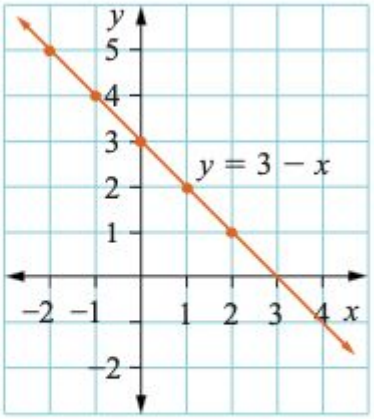
h

x	-2	-1	0	1	2
y	0	$\frac{1}{2}$	1	$1\frac{1}{2}$	2



i

x	-2	-1	0	1	2
y	5	4	3	2	1



5 **a** $x = 4$ **b** $x = 4$ **c** $x = -4$

d $x = 4$ **e** $x = -3$ **f** $x = 3\frac{1}{2}$

g $x = -\frac{1}{2}$ **h** $x = -4$ **i** $x = 4$