LINE EQUATIONS

A DEFINITION

A.1 COMPLETING A TABLE OF VALUES

Ex 1: For $y = x + 3$, fill in the table:

x	-2	-1	0	1	2
y	$\boxed{1}$	$\boxed{2}$	$\boxed{3}$	$\boxed{4}$	$\boxed{5}$

Answer:

- For $x = -2$,
$$\begin{aligned} y &= (-2) + 3 \\ &= 1 \end{aligned}$$
- For $x = -1$,
$$\begin{aligned} y &= (-1) + 3 \\ &= 2 \end{aligned}$$
- For $x = 0$,
$$\begin{aligned} y &= 0 + 3 \\ &= 3 \end{aligned}$$
- For $x = 1$,
$$\begin{aligned} y &= 1 + 3 \\ &= 4 \end{aligned}$$
- For $x = 2$,
$$\begin{aligned} y &= 2 + 3 \\ &= 5 \end{aligned}$$

So the completed table is:

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

Ex 2: For $y = -2x + 1$, fill in the table:

x	-2	-1	0	1	2
y	$\boxed{5}$	$\boxed{3}$	$\boxed{1}$	$\boxed{-1}$	$\boxed{-3}$

Answer:

- For $x = -2$,
$$\begin{aligned} y &= -2 \times (-2) + 1 \\ &= 4 + 1 \\ &= 5 \end{aligned}$$
- For $x = -1$,
$$\begin{aligned} y &= -2 \times (-1) + 1 \\ &= 2 + 1 \\ &= 3 \end{aligned}$$
- For $x = 0$,
$$\begin{aligned} y &= -2 \times 0 + 1 \\ &= 0 + 1 \\ &= 1 \end{aligned}$$
- For $x = 1$,
$$\begin{aligned} y &= -2 \times 1 + 1 \\ &= -2 + 1 \\ &= -1 \end{aligned}$$
- For $x = 2$,
$$\begin{aligned} y &= -2 \times 2 + 1 \\ &= -4 + 1 \\ &= -3 \end{aligned}$$

So the completed table is:

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

Ex 3: For $y = 3x - 5$, fill in the table:

x	-2	-1	0	1	2
y	$\boxed{-11}$	$\boxed{-8}$	$\boxed{-5}$	$\boxed{-2}$	$\boxed{1}$

Answer:

- For $x = -2$,
$$\begin{aligned} y &= 3 \times (-2) - 5 \\ &= -6 - 5 \\ &= -11 \end{aligned}$$
- For $x = -1$,
$$\begin{aligned} y &= 3 \times (-1) - 5 \\ &= -3 - 5 \\ &= -8 \end{aligned}$$
- For $x = 0$,
$$\begin{aligned} y &= 3 \times 0 - 5 \\ &= 0 - 5 \\ &= -5 \end{aligned}$$
- For $x = 1$,
$$\begin{aligned} y &= 3 \times 1 - 5 \\ &= 3 - 5 \\ &= -2 \end{aligned}$$
- For $x = 2$,
$$\begin{aligned} y &= 3 \times 2 - 5 \\ &= 6 - 5 \\ &= 1 \end{aligned}$$

So the completed table is:

x	-2	-1	0	1	2
y	-11	-8	-5	-2	1

Ex 4:  For $y = -2.5x - 2$, fill in the table:

x	-2	-1	0	1	2
y	$\boxed{3}$	$\boxed{0.5}$	$\boxed{-2}$	$\boxed{-4.5}$	$\boxed{-7}$

Answer:

- For $x = -2$,
$$\begin{aligned} y &= -2.5 \times (-2) - 2 \\ &= 5 - 2 \\ &= 3 \end{aligned}$$

- For $x = -1$,
$$\begin{aligned} y &= -2.5 \times (-1) - 2 \\ &= 2.5 - 2 \\ &= 0.5 \end{aligned}$$
- For $x = 0$,
$$\begin{aligned} y &= -2.5 \times 0 - 2 \\ &= 0 - 2 \\ &= -2 \end{aligned}$$
- For $x = 1$,
$$\begin{aligned} y &= -2.5 \times 1 - 2 \\ &= -2.5 - 2 \\ &= -4.5 \end{aligned}$$
- For $x = 2$,
$$\begin{aligned} y &= -2.5 \times 2 - 2 \\ &= -5 - 2 \\ &= -7 \end{aligned}$$

So the completed table is:

x	-2	-1	0	1	2
y	3	0.5	-2	-4.5	-7

Ex 5: For $y = 0.5x + 1$, fill in the table:

x	-2	-1	0	1	2
y	0	0.5	1	1.5	2

Answer:

- For $x = -2$,
$$\begin{aligned} y &= 0.5 \times (-2) + 1 \\ &= -1 + 1 \\ &= 0 \end{aligned}$$
- For $x = -1$,
$$\begin{aligned} y &= 0.5 \times (-1) + 1 \\ &= -0.5 + 1 \\ &= 0.5 \end{aligned}$$
- For $x = 0$,
$$\begin{aligned} y &= 0.5 \times 0 + 1 \\ &= 0 + 1 \\ &= 1 \end{aligned}$$
- For $x = 1$,
$$\begin{aligned} y &= 0.5 \times 1 + 1 \\ &= 0.5 + 1 \\ &= 1.5 \end{aligned}$$
- For $x = 2$,
$$\begin{aligned} y &= 0.5 \times 2 + 1 \\ &= 1 + 1 \\ &= 2 \end{aligned}$$

So the completed table is:

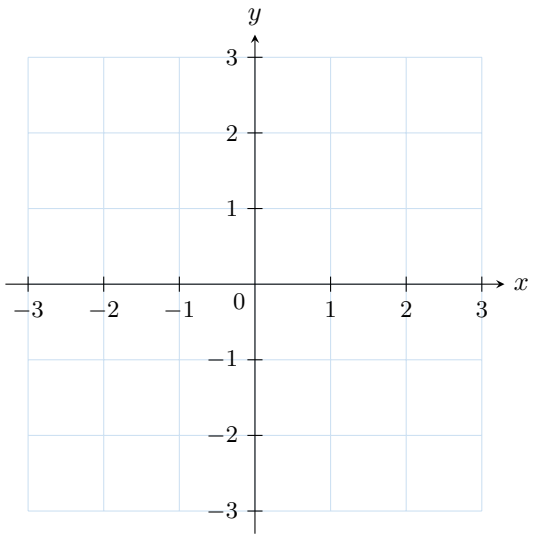
x	-2	-1	0	1	2
y	0	0.5	1	1.5	2

A.2 GRAPHING A LINE FROM TWO POINTS

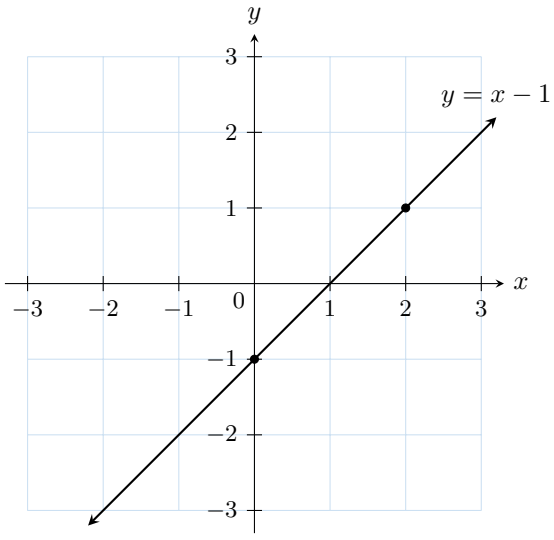
Ex 6: Here is a table of values for the line equation $y = x - 1$:

x	0	2
y	-1	1

Plot the line.



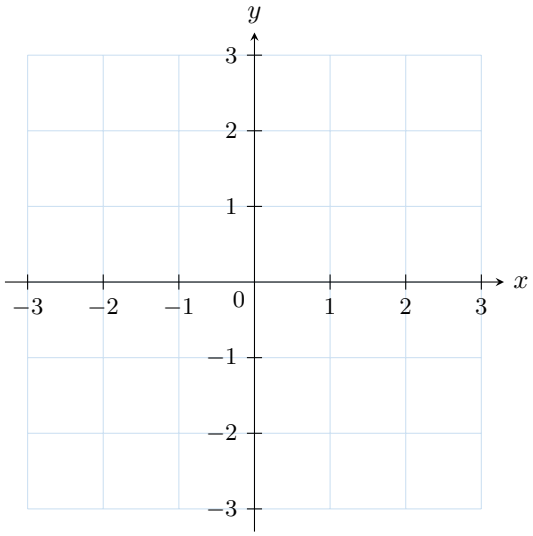
Answer: Plot the points $(0, -1)$ and $(2, 1)$. Then, draw the line passing through the two points.



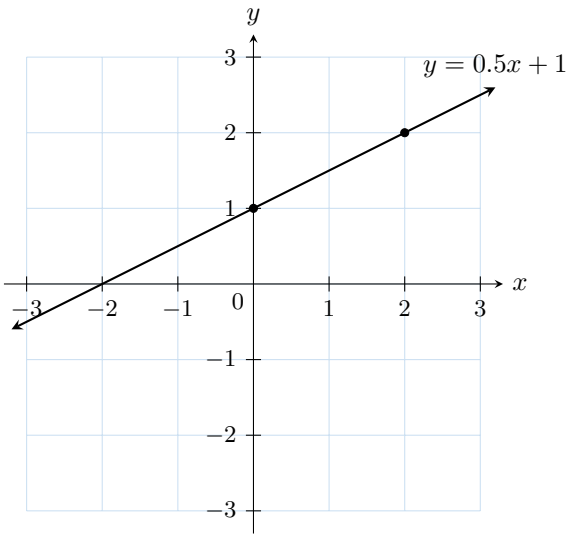
Ex 7: Here is a table of values for the line equation $y = 0.5x + 1$:

x	0	2
y	1	2

Plot the line.



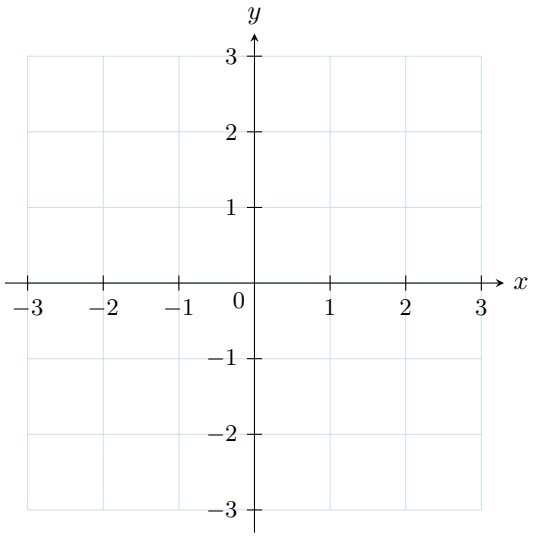
Answer: Plot the points $(0, 1)$ and $(2, 2)$. Then, draw the line passing through the two points.



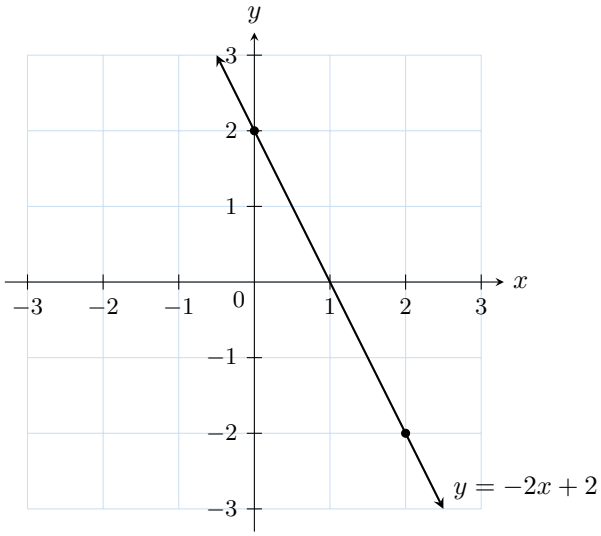
Ex 8: Here is a table of values for the line equation $y = -2x + 2$:

x	0	2
y	2	−2

Plot the line.



Answer: Plot the points $(0, 2)$ and $(2, -2)$. Then, draw the line passing through the two points.

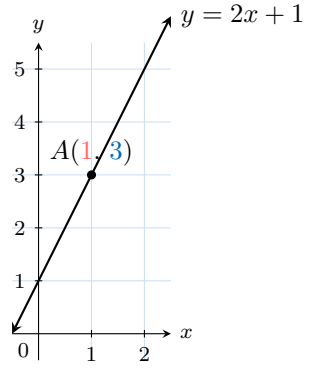


A.3 FINDING COORDINATE POINTS

Ex 9: Find the coordinates of the point A on the line with the equation $y = 2x + 1$:

$$A(1, \boxed{3})$$

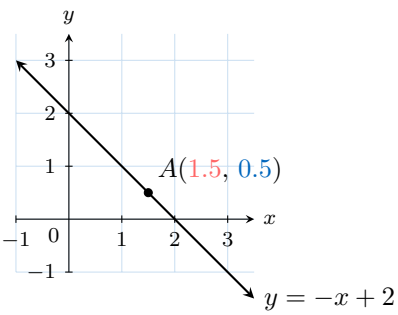
Answer:

- For $x = 1$,
$$y = 2 \times 1 + 1$$
$$= 3$$
- The coordinates of A are $A(1, 3)$.
- 

Ex 10: Find the coordinates of the point A on the line with the equation $y = -x + 2$:

$$A(1.5, \boxed{0.5})$$

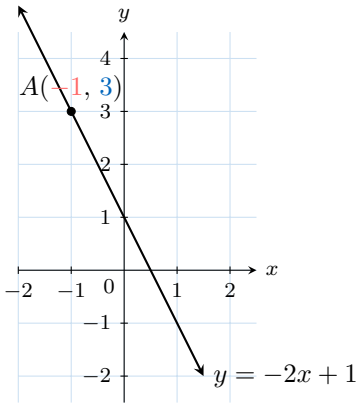
Answer:

- For $x = 1.5$,
$$y = -1.5 + 2$$
$$= 0.5$$
- The coordinates of A are $A(1.5, 0.5)$.
- 

Ex 11: Find the coordinates of the point A on the line with the equation $y = -2x + 1$:

$$A(-1, \boxed{3})$$

Answer:

- For $x = -1$,
$$\begin{aligned} y &= -2 \times -1 + 1 \\ &= 3 \end{aligned}$$
- The coordinates of A are $A(-1, 3)$.
- 

A.4 DETERMINING WHETHER A POINT IS ON A LINE

MCQ 12: Determine whether the point $(3, 6)$ lies on the line with the equation $y = 2x + 1$.

☐ Yes

☒ No

Answer:

- For $x = 3$ in the equation $y = 2x + 1$:
$$\begin{aligned} y &= 2 \times 3 + 1 \\ &= 7 \neq 6 \end{aligned}$$
- Therefore, the point $(3, 6)$ does **not** lie on the line.

MCQ 13: Determine whether the point $(4, -3)$ lies on the line with the equation $y = -2x + 5$.

☒ Yes

☐ No

Answer:

- For $x = 4$ in the equation $y = -2x + 5$:
$$\begin{aligned} y &= -2 \times 4 + 5 \\ &= -8 + 5 \\ &= -3 \end{aligned}$$
- Therefore, the point $(4, -3)$ **does** lie on the line.

MCQ 14: Determine whether the point $(2, 2)$ lies on the line with the equation $y = x - 1$.

☐ Yes

☒ No

Answer:

- For $x = 2$ in the equation $y = x - 1$:
$$\begin{aligned} y &= 2 - 1 \\ &= 1 \neq 2 \end{aligned}$$
- Therefore, the point $(2, 2)$ does **not** lie on the line.

MCQ 15: Determine whether the point $(0, -2)$ lies on the line with the equation $y = 3x - 2$.

☒ Yes

☐ No

Answer:

- For $x = 0$ in the equation $y = 3x - 2$:
$$\begin{aligned} y &= 3 \times 0 - 2 \\ &= 0 - 2 \\ &= -2 \end{aligned}$$
- Therefore, the point $(0, -2)$ **does** lie on the line.