

WorkSHEET 3.1 Linear graphs

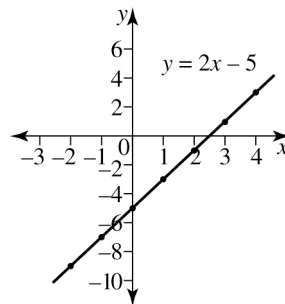
Name: _____

- 1 Complete the table of values for the rule $y = 2x - 5$ and use the range of x values given to plot the linear graph.

$$y = 2x - 5$$

x	-2	-1	0	1	2	3	4
y							

x	-2	-1	0	1	2	3	4
y	-9	-7	-5	-3	-1	1	3

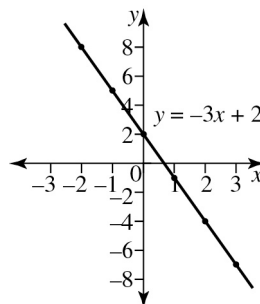


- 2 Complete the table of values for the rule $y = -3x + 2$ and use the range of x values given to plot the linear graph.

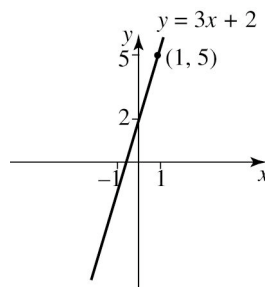
$$y = -3x + 2$$

x	-2	-1	0	1	2	3
y						

x	-2	-1	0	1	2	3
y	8	5	2	-1	-4	-7

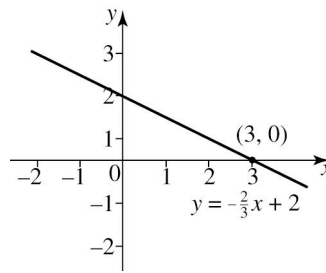


- 3 Sketch the graph of the linear equation $y = 3x + 2$ using the gradient–intercept method:



4 Sketch the graph of the linear equation

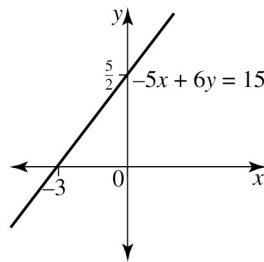
$y = -\frac{2}{3}x + 2$ using the gradient–intercept method:



5 Sketch the graph of $-5x + 6y = 15$.

$$\begin{aligned} -5x + 6y &= 15 \\ \text{x-intercept when } y &= 0, \\ -5x &= 15 \\ x &= -3 \end{aligned}$$

$$\begin{aligned} \text{y-intercept when } x &= 0, \\ 6y &= 15 \\ y &= \frac{5}{2} \end{aligned}$$



6 For $2(y - 6) = 5(x - 2)$ find:

$$2(y - 6) = 5(x - 2)$$

$$2y - 12 = 5x - 10$$

$$2y = 5x + 2$$

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

(a) the gradient

(a) $m = \frac{5}{2}$

(b) the y -intercept

(b) y -intercept = 1

(c) the x -intercept

(c) the x -intercept, when $y = 0$

$$0 = \frac{5}{2}x + 1$$

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

$$-2 = 5x$$

$$x = -\frac{2}{5}$$

7 Sketch the graph of $3(y + 4) = 2(x - 1)$.

$$3(y + 4) = 2(x - 1)$$

the x -intercept, when $y = 0$

$$3(0 + 4) = 2(x - 1)$$

$$12 = 2x - 2$$

$$14 = 2x$$

$$x = 7$$

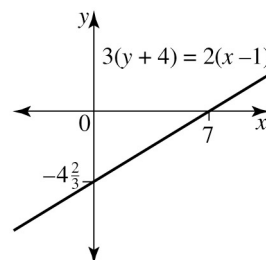
the y -intercept, when $x = 0$

$$3(y + 4) = 2(0 - 1)$$

$$3y + 12 = -2$$

$$3y = -14$$

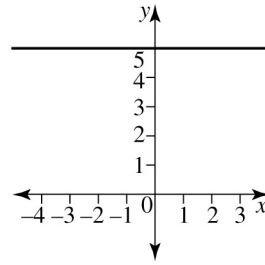
$$y = -4\frac{2}{3}$$



8 Sketch the graphs of:

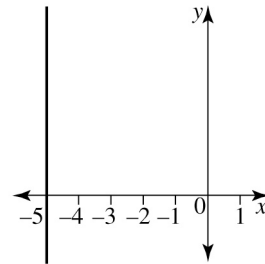
(a) $y = 5$

(a) a horizontal line passing through $y = 5$



(b) $x = -5$

(b) a vertical line passing through $x = -5$



9 Determine the equation of the linear graphs when:

(a) x -intercept = -3 , y -intercept = -3

(a) Points $(-3, 0)$ and $(0, -3)$

$$\begin{aligned} m &= \frac{y_2 - y_1}{x_2 - x_1} \\ &= \frac{-3 - 0}{0 - (-3)} \\ &= \frac{-3}{3} \\ &= -1 \end{aligned}$$

$$\begin{aligned} y &= mx + c \\ y &= -x - 3 \end{aligned}$$

(b) y -intercept = 5 , x -intercept = -4

(b) Points $(0, 5)$ and $(-4, 0)$

$$\begin{aligned} m &= \frac{y_2 - y_1}{x_2 - x_1} \\ &= \frac{0 - 5}{-4 - 0} \\ &= \frac{-5}{-4} \\ &= \frac{5}{4} \end{aligned}$$

$$\begin{aligned} y &= mx + c \\ y &= \frac{5}{4}x + 5 \\ 4y &= 5x + 20 \end{aligned}$$

10 Determine the equation of the straight line with:

(a) gradient = -2 and y -intercept = -2

(a) $m = -2$ and $c = -2$

$$y = mx + c$$

$$y = -2x - 2$$

(b) gradient = 2 and x -intercept = 2

(b) $m = 2$ passing through $(2, 0)$

$$y = mx + c$$

$$y = 2x + c \quad \text{substitute the point } (2, 0)$$

$$0 = 2(2) + c$$

$$0 = 4 + c$$

$$c = -4$$

$$y = 2x - 4$$
