

2. Writing Linear Equation in the form $y=mx+b$

How to go from $6x + 3y = 18$ to $y = -2x + 9$?

Let's solve the equation for y ! Get y by itself

$$\begin{array}{r} 6x + 3y = 18 \\ -6x \quad \quad -6x \end{array}$$

$$\frac{3y}{3} = \frac{18 - 6x}{3}$$

$$y = \frac{18}{3} - \frac{6x}{3}$$

1) Get the y -term
by itself

2) Get y by itself

* Each term is divided
by 3*

$y = 9 - 2x$ or $y = -2x + 9$

Why solving for y ?

To find the slope (m) and y -intercept (b) of the graph!

More examples:

$$a) \quad \cancel{4x} + y = 9$$

$-4x \qquad -4x$

$$y = 9 - 4x$$

or

$$y = \boxed{-4x + 9}$$

$\downarrow \qquad \downarrow$
 $m \qquad b$

$$b) \quad \cancel{3x} + 2y = 6$$

$-3x \qquad -3x$

$$\frac{2y}{2} = \frac{6 - 3x}{2}$$

$$y = \frac{6}{2} - \frac{3x}{2}$$

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

or

$$y = \boxed{-\frac{3}{2}x + 3}$$

$\downarrow \qquad \downarrow$
 $m \qquad b$

$$c) \quad \cancel{5x} - y = 10$$

$-5x \qquad -5x$

$$\frac{-y}{-1} = \frac{10 - 5x}{-1}$$

$$y = \frac{10}{-1} - \frac{5x}{-1}$$

$$y = -10 + 5x$$

or

$$y = \boxed{5x - 10}$$

$\downarrow \qquad \downarrow$
 $m \qquad b$

$$d) \quad 2(x - 5) + 5y = 3$$

$$\cancel{2x} - \cancel{10} + 5y = 3$$

$-2x + 10$

$$\frac{5y}{5} = \frac{-2x + 13}{5}$$

$$y = \boxed{-\frac{2x}{5} + \frac{13}{5}}$$

$\downarrow \qquad \downarrow$
 $m \qquad b$