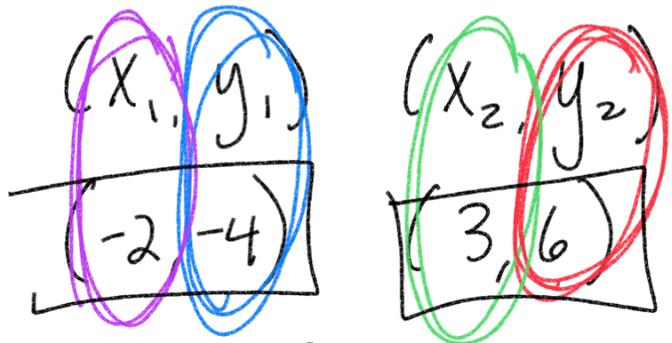
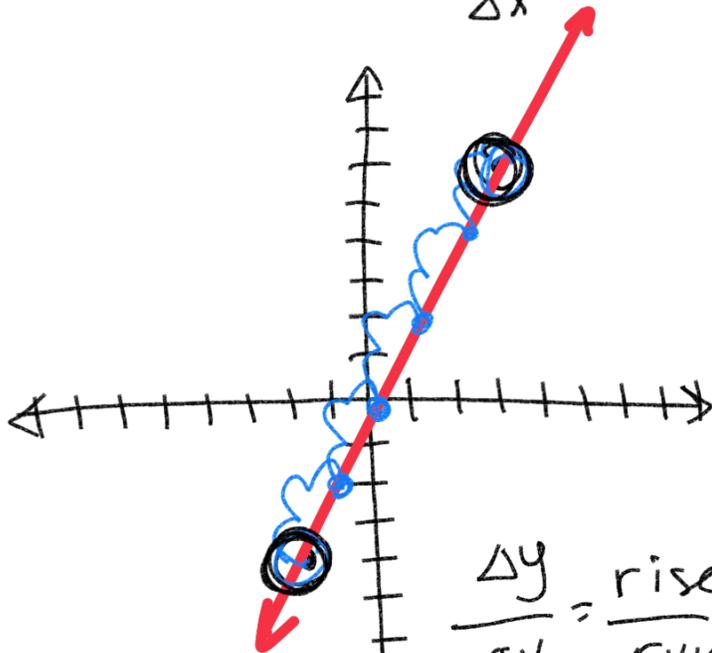


slope = $\frac{\text{rise}}{\text{run}} = \frac{\text{change in } y}{\text{change in } x} = \frac{\Delta y}{\Delta x}$ delta → change

slope = $\left\{ \frac{y_2 - y_1}{x_2 - x_1} \right\}$



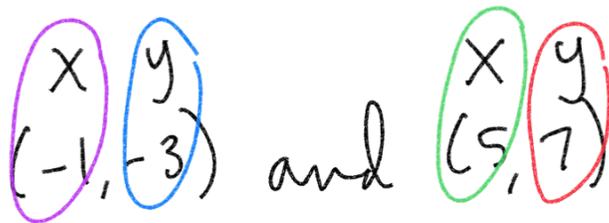
slope = $\frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$



$\left\{ \frac{y_2 - y_1}{x_2 - x_1} = \frac{6 - (-4)}{3 - (-2)} = \frac{6 + 4}{3 + 2} \right.$

$\frac{\Delta y}{\Delta x} = \frac{\text{rise}}{\text{run}} = \frac{2 \text{ up}}{1 \text{ over}} = \frac{10}{5} = \frac{2}{1} = 2$

slope → ⊕ up
⊖ down



slope = $\frac{y_2 - y_1}{x_2 - x_1}$

$\frac{7 - (-3)}{5 - (-1)} = \frac{7 + 3}{5 + 1} = \frac{10 \div 2}{6 \div 2} = \frac{5}{3}$

$\frac{-3 - 7}{-1 - 5} = \frac{-10 \div -2}{-6 \div -2} = \frac{5}{3}$

$$(6, 9) \text{ and } (-2, -7)$$

$$\text{slope} = m = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{9 - (-7)}{6 - (-2)} = \frac{9 + 7}{6 + 2} = \frac{16}{8} = \boxed{2}$$

$$\frac{-7 - 9}{-2 - 6} = \frac{-16}{-8} = \boxed{2}$$

Linear Equations

Slope-Intercept form

$$y = mx + b$$

↑
slope

↑
y-intercept

$$\text{slope} = \frac{2}{3} \quad m = \frac{2}{3}$$
$$\text{y-int} = 4 \quad b = 4$$

$$y = \frac{2}{3}x + 4$$

$$y = mx + b$$

$$\text{slope} = -\frac{4}{3}$$
$$\text{y-int} = -11$$

$$y = -\frac{4}{3}x - 11$$

$(-4, 2)$ and $(0, 8)$

1.) Find slope

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{8 - 2}{0 - (-4)} = \frac{6}{0 + 4} = \frac{6 \div 2}{4 \div 2} = \left(\frac{3}{2}\right)$$

$$m = \frac{3}{2}$$

2.) Use $y = mx + b$

solve for b

$$2 = \frac{3}{2}(-4) + b$$

$$2 = \frac{-12}{2} + b$$

$$2 = -6 + b$$

$$+b \quad +b$$
$$8 = b$$

$$y = mx + b$$
$$y = \frac{3}{2}x + 8$$

$$\begin{matrix} x_2 & y_2 \\ (1, & 7) \end{matrix} \text{ and } \begin{matrix} x_1 & y_1 \\ (-2, & 1) \end{matrix}$$

Find the linear equation

$$y = mx + b$$

1.) Find the slope

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{7 - 1}{1 - (-2)} = \frac{6}{1 + 2} = \frac{6}{3} = \boxed{2}$$

$$\boxed{m = 2}$$

2.) Find $y = mx + b$

$$(1, 7)$$



$$7 = (2)(1) + b$$

$$7 = 2 + b$$

$$-2 \quad -2$$

$$\boxed{5 = b}$$

$$y = mx + b$$

$$\boxed{y = 2x + 5}$$

Or..... Use point-slope form

$$(x_2 - x_1) m = \left(\frac{y_2 - y_1}{x_2 - x_1} \right) (\cancel{x_2 - x_1}) \quad y_2 - y_1 = m(x_2 - x_1)$$

$$\boxed{y - y_1 = m(x - x_1)}$$

$(1, 7)$ and $(-2, 1)$

1.) Find the slope $m = 2$

$$y - y_1 = m(x - x_1)$$

x_1
 $(1, 7)$
 y_1

2.) Use point-slope

$$y - y_1 = m(x - x_1)$$

$$y - 7 = 2(x - 1)$$

$$y - 7 = 2x - 2$$

$+7$ $+7$

$$y = 2x + 5$$