

$$\boxed{y = ax + b} \Rightarrow \underline{\text{standard form}}$$

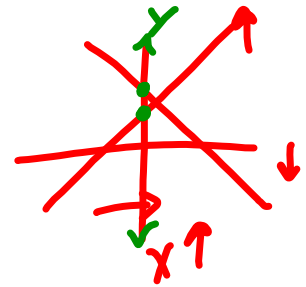
x } variables
y }

$$y = \underline{2}x + \underline{3}$$

$$y = \underline{-\frac{4}{5}}x + \underline{8}$$

a \Rightarrow slope ^{visual} rate of change (roc) ^{math}

b \Rightarrow initial value, y-intercept



Find equation of a line

- Need 2 points

$$(x_1, y_1) \\ (8, 15)$$

$$(x_2, y_2) \\ (6, 13)$$

$$y = ax + b$$

\downarrow \downarrow
 $a = ?$ $b = ?$

$$\textcircled{1} \quad a = \frac{y_2 - y_1}{x_2 - x_1} = \frac{13 - 15}{6 - 8} = \frac{-2}{-2} = +1 \quad \Rightarrow y = 1x + b$$

$$\textcircled{2} \quad \underline{\text{Pick a point}}: (6, 13) \Rightarrow x = 6 \quad y = 13 \Rightarrow 13 = 1(6) + b$$

$$13 = 6 + b$$

$$13 - 6 = b$$

$$7 = b$$

$$\boxed{y = 1x + 7}$$

$$(x, y) \quad (x_2, y_2) \quad ; \quad (x_1, y_1)$$

Find the equation of the line. $(y = ax + b)$

$$\textcircled{1} a = \frac{-2 - 1}{8 - 2} = \frac{-3}{6} \quad \text{OR} \quad a = \frac{1 - (-2)}{2 - 8} = \frac{3}{-6}$$

$$= -\frac{1}{2} \qquad = -\frac{1}{2}$$

$$= -0.5 \qquad = -0.5$$

$$\textcircled{1} a = \frac{y_2 - y_1}{x_2 - x_1}$$

$\textcircled{2} b =$

$$\textcircled{2} y = -\frac{1}{2}x + b \quad \text{using } (8, -2)$$

$$-2 = \left[-\frac{1}{2}(8)\right] + b$$

$$-2 = -4 + b$$

$$-2 + 4 = b$$

$$2 = b$$

$$\text{using } (2, 1)$$

$$1 = -\frac{1}{2}(2) + b$$

$$1 = -1 + b$$

$$1 + 1 = b$$

$$2 = b$$

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

$$\boxed{y = ax + b}$$

$$(3, 7) \text{ ; } (5, 12)$$

$$\textcircled{1} a = \frac{y_2 - y_1}{x_2 - x_1}$$

$$a = \frac{12 - 7}{5 - 3} = \frac{5}{2} \text{ or } 2.5$$

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

$$\textcircled{2} b \Rightarrow 7 = \frac{5}{2}(3) + b$$

$$7 = \frac{15}{2} + b$$

$$7 - \frac{15}{2} = b$$

$$= \frac{14}{2} - \frac{15}{2} = -\frac{1}{2}$$

$$= -0.5 = b$$

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

General form

$$2x + 5y = 12$$

convert to standard form: $y = ax + b$

$$2x + 5y = 12$$

$-2x$ $-2x$

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

$$\frac{5y}{5} = \frac{-2x}{5} + \frac{12}{5}$$

$$y = -\frac{2}{5}x + \frac{12}{5} \quad \text{or} \quad y = -0.4x + 2.4$$

General to Standard $y = ax + b$

$$6x - 3y = 15$$

$$-3y = -6x + 15$$

$$\frac{-3y}{-3} = \frac{-6x}{-3} + \frac{15}{-3}$$

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