

## Geometry - 3.4 - Equations of Lines

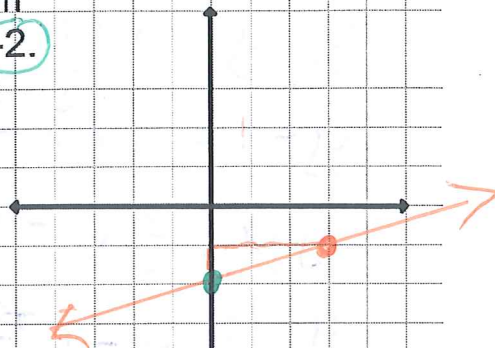
GIVEN	Slope and y-intercept	Slope and a point	Two points
USE	<p>Slope-int Form</p> $y = m \cdot x + b$ <p>↑ slope (rise/run)    ↑ y-int (0, b)</p>	<p>point-slope form</p> $y - y_1 = m(x - x_1)$ <p>↑ slope (rise/run)    ↑ Point (x<sub>1</sub>, y<sub>1</sub>)</p>	<p>• Calculate Slope</p> $\frac{y_2 - y_1}{x_2 - x_1} = \frac{2 - 4}{3 - 1} = \frac{-2}{2} = -1$ <p>• Choose 1 point</p> <p>• Put in Point-slope Form</p>

**Ex 1** - Write an equation in slope-intercept form of the line with slope of  $\frac{1}{3}$  and y-intercept of  $-2$ .

$$y = m \cdot x + b$$

$$y = \frac{1}{3}x + -2$$

$$y = \frac{1}{3}x - 2$$



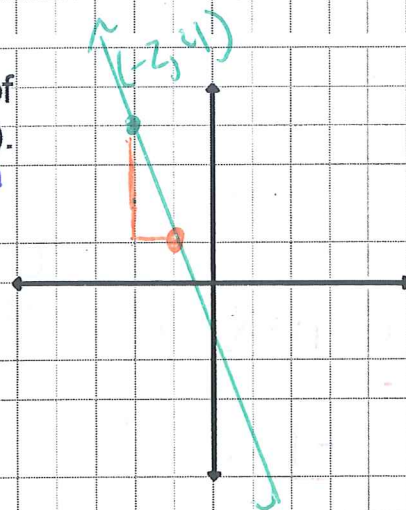
**Ex 2** - Write an equation in point-slope form of the line whose slope is  $-3$  that contains  $(-2, 4)$ .

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

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

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

$$\begin{matrix} -3 & \text{rise} \\ 1 & \text{run} \end{matrix}$$



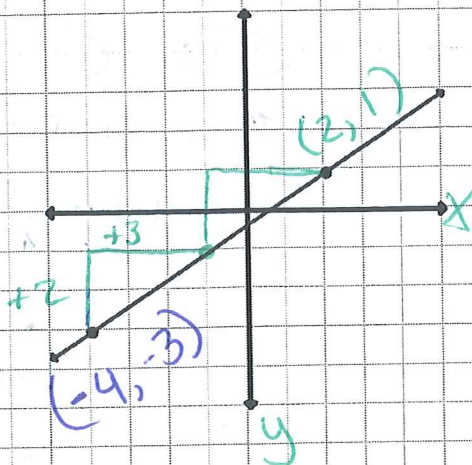


**Ex 3** - Write an equation in slope-intercept form for the line shown on the graph.

$$\begin{array}{c|c} x & y \\ \hline -4 & -3 \\ 2 & 1 \end{array}$$

$$\frac{\Delta y}{\Delta x} = \frac{4}{6} = \frac{2}{3}$$

$$\text{slope} = \frac{2}{3}$$



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

$$y - 1 = \frac{2}{3}(x - 2)$$

$$y - 1 = \frac{2}{3}x - \frac{4}{3}$$

$$y = \frac{2}{3}x - \frac{1}{3}$$

**Ex 4** - Write an equation in slope-intercept form for a line containing (0, 3) that is perpendicular to the line  $y = x - 2$ .

$$y = mx + b$$

$$y = -1x + 3$$

$$y = 1x - 2$$

1 rise  
1 run

$$\frac{1}{1} \rightarrow -\frac{1}{1}$$

