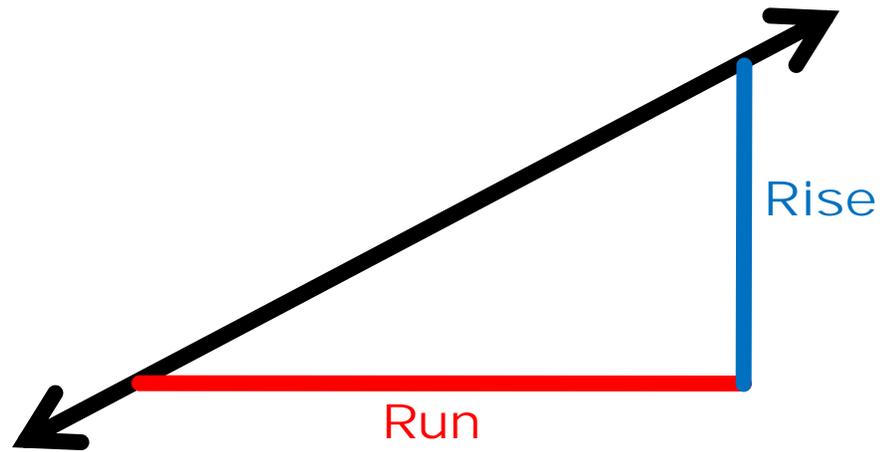


3.6

FINDING THE SLOPE AND EQUATION OF A LINE

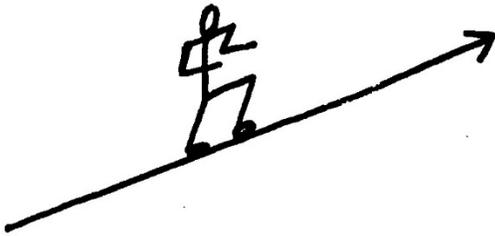
SLOPE OF A LINE



$$\text{slope} = \frac{\text{rise}}{\text{run}}$$

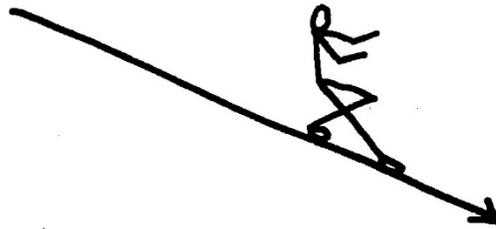
SLOPE OF A LINE

going up



positive slope

going down



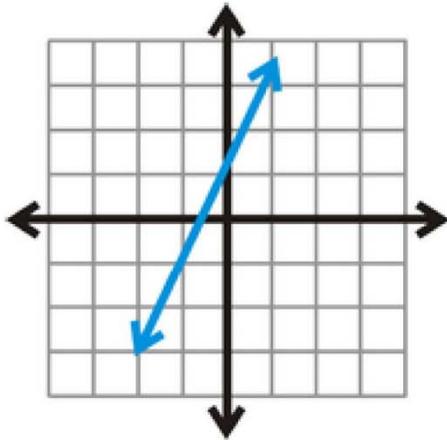
negative slope

level

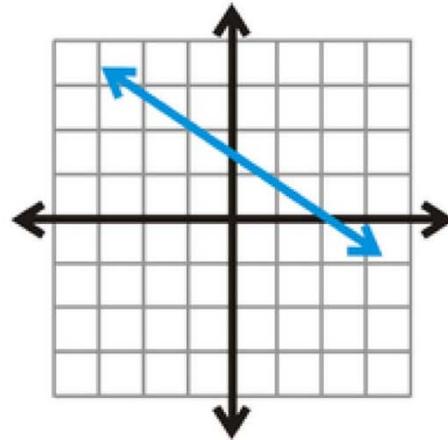


0 slope

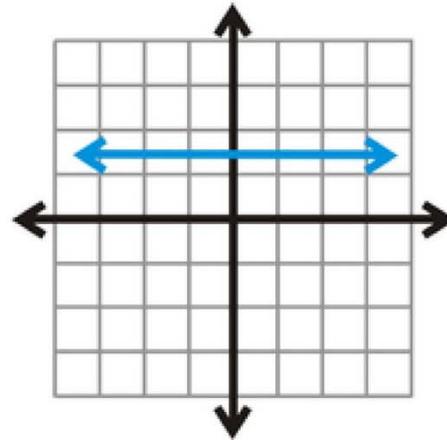
SLOPE OF A LINE



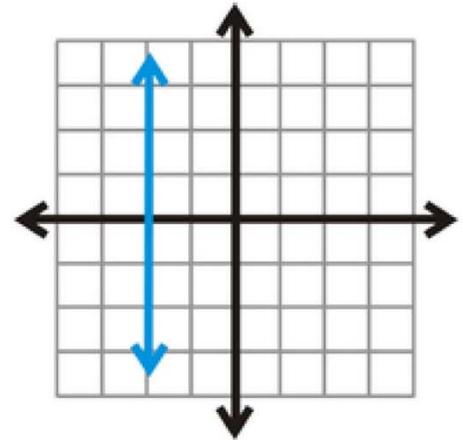
positive slope



negative slope

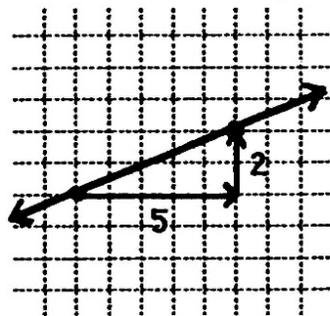


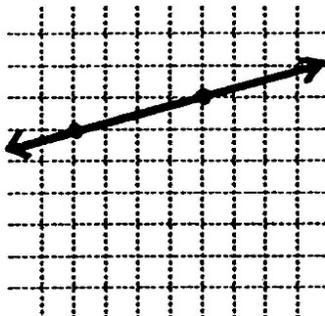
zero slope

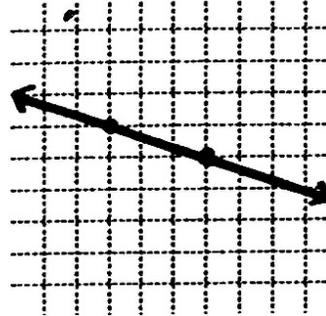


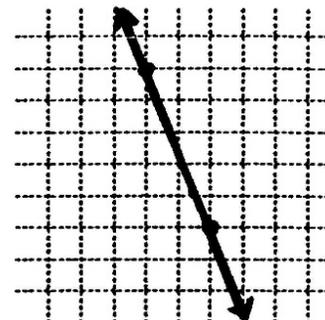
undefined slope

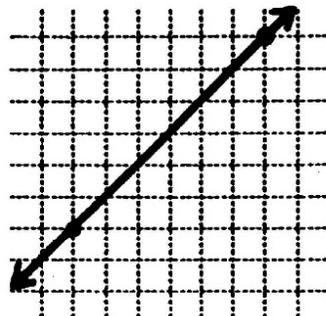
Find the slope of each line. Simplify the slope or write it as an integer if you can.

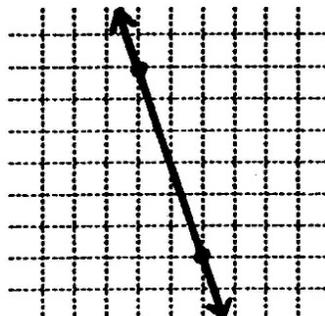


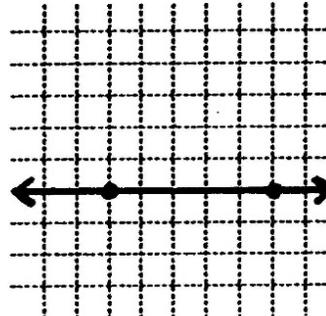


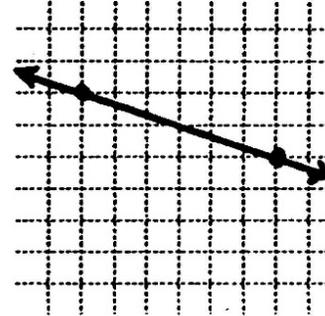












Through each point draw a line that has the slope shown below the grid. Use a ruler.

.....

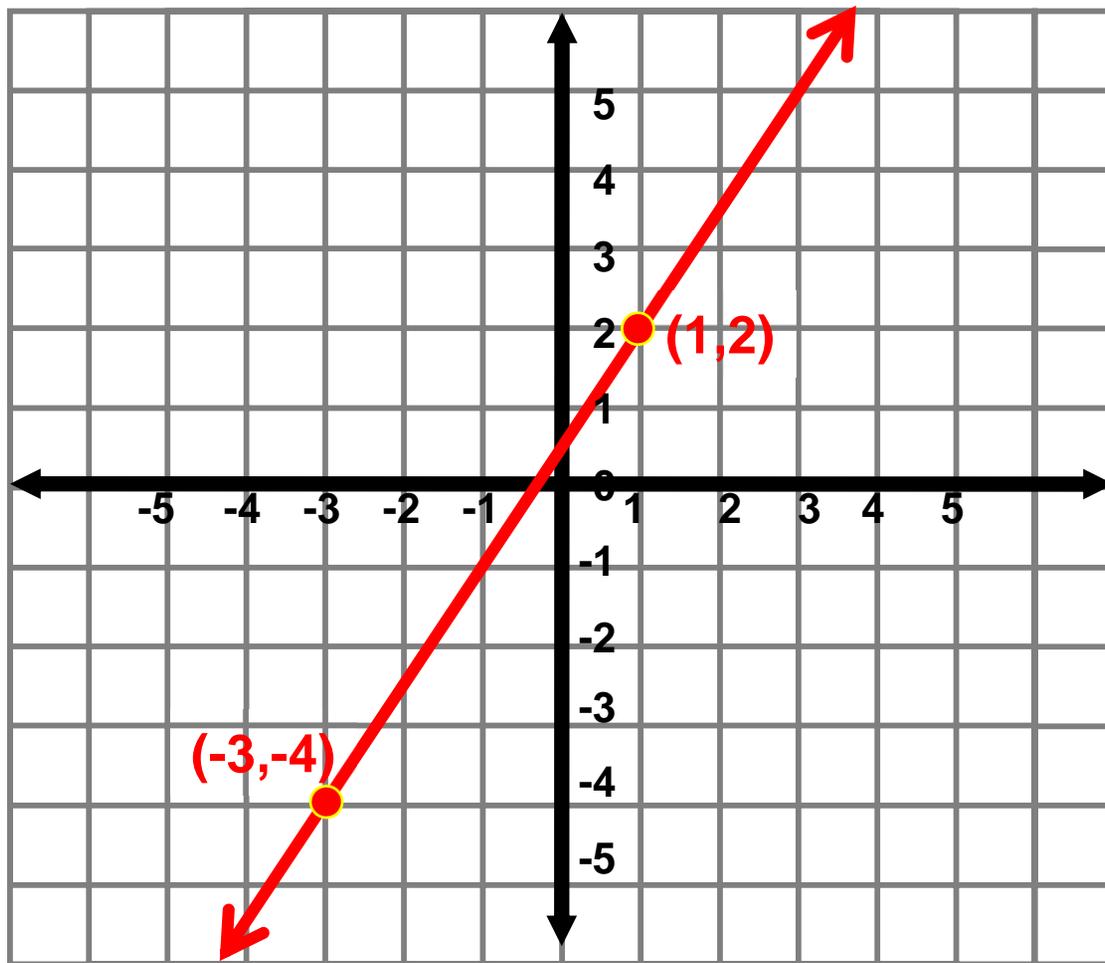
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SLOPE FORMULA

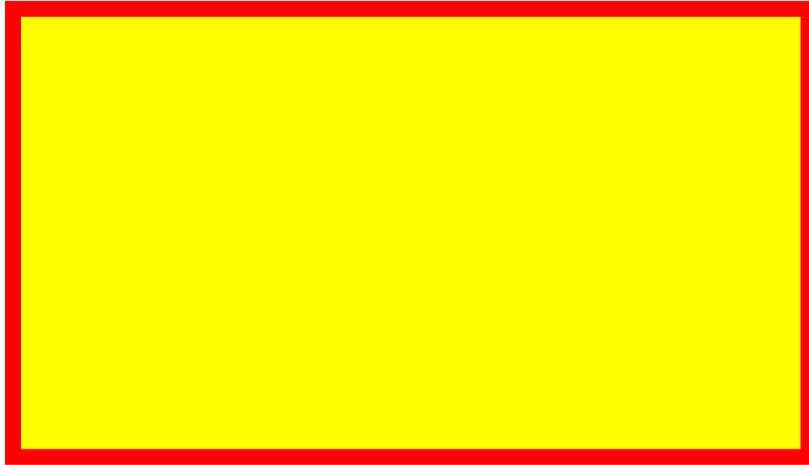
$(-3, -4)$ and $(1, 2)$



SLOPE FORMULA

$$\begin{matrix} (-3, -4) & \text{and} & (1, 2) \\ (x_1, y_1) & & (x_2, y_2) \end{matrix}$$

If you do not have the graph of a line use...



SLOPE FORMULA

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

Find the slope between the two points:

1) $(7, -6)$ *and* $(-5, 2)$

2) $(-2, 3)$ *and* $(4, 8)$

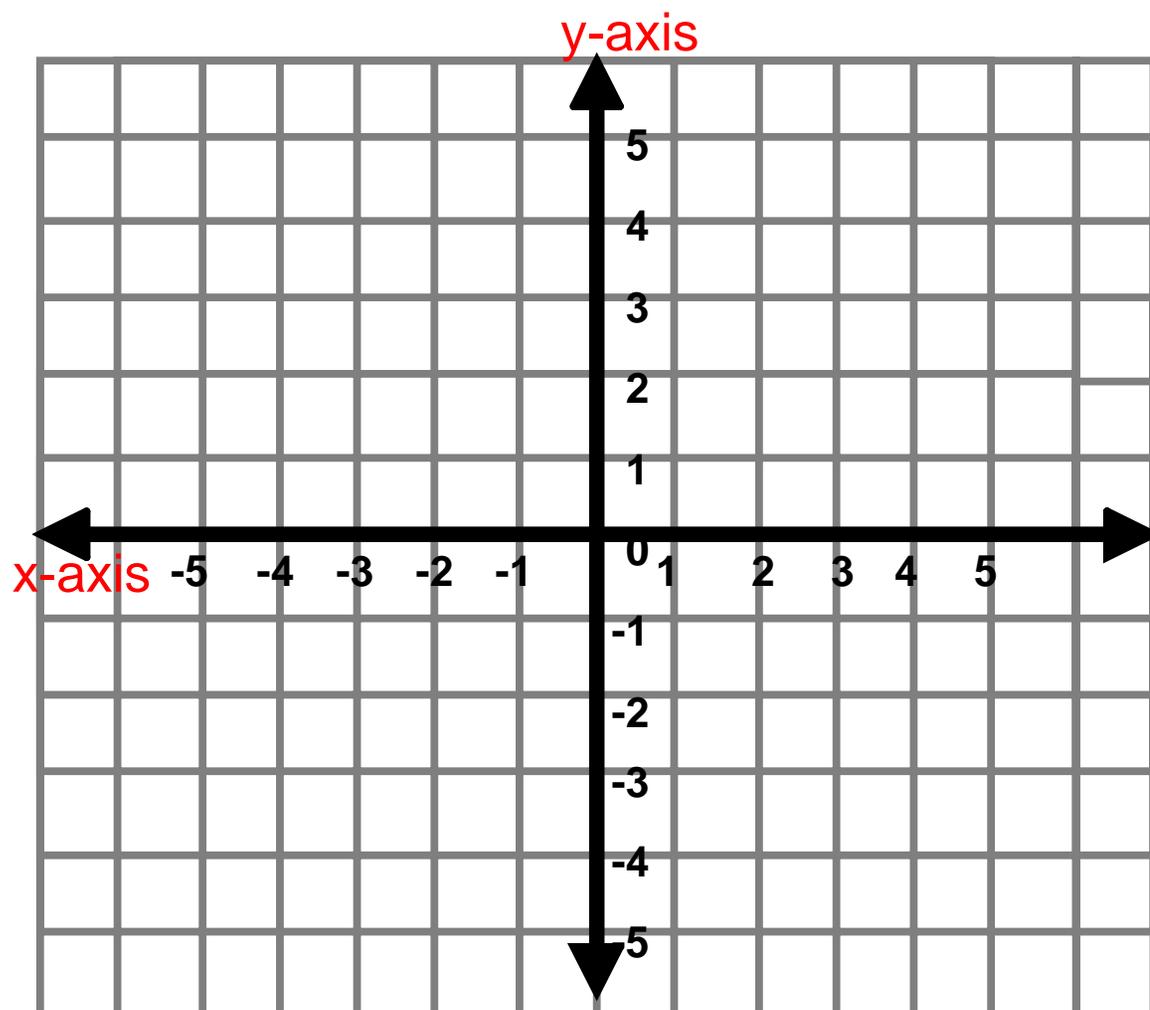
3) $(6, 3)$ *and* $(2, 0)$

Review

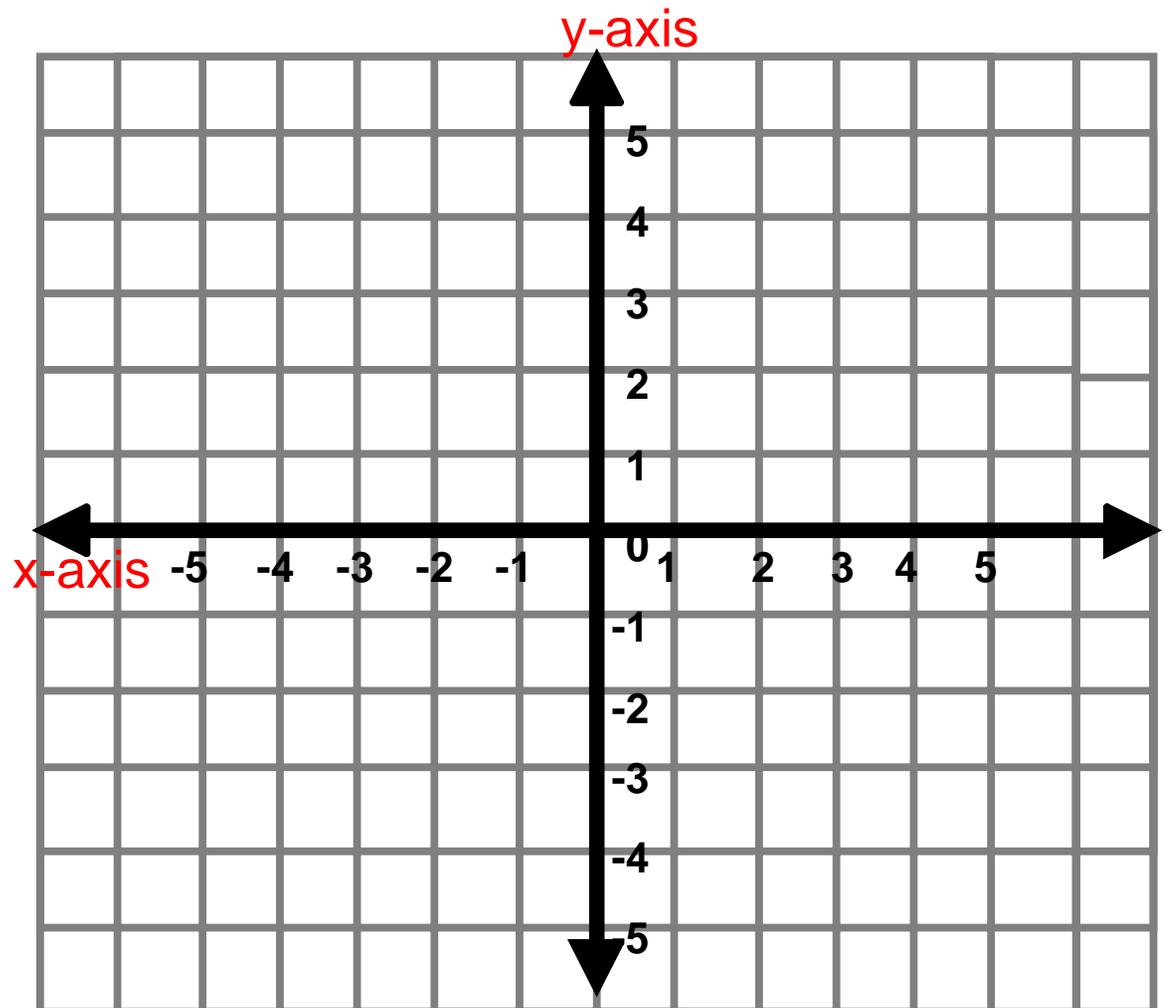
$$y = mx + b$$
Two red arrows point upwards from below the equation. The first arrow points to the variable m , and the second arrow points to the variable b .

Slope-Intercept Form

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



$$y = -2x + 1$$



Practice

$$y = mx + b$$

Write an equation in slope-intercept form of the line passing through the given points.

$$(4, -3), (3, -6)$$

Practice

$$y = mx + b$$

Write an equation in slope-intercept form of the line passing through the given points.

$$(-2, 5), (4, 8)$$

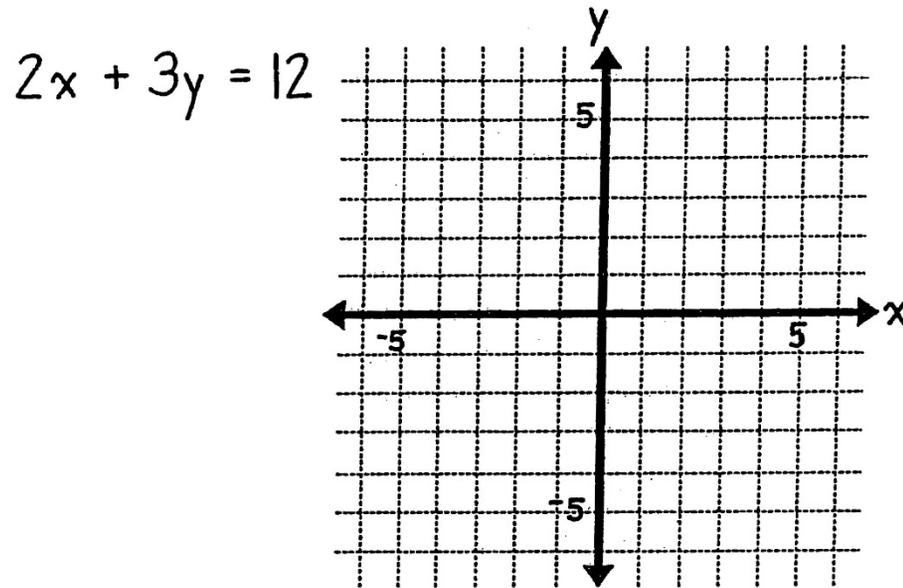
Review

$$ax + by = c$$

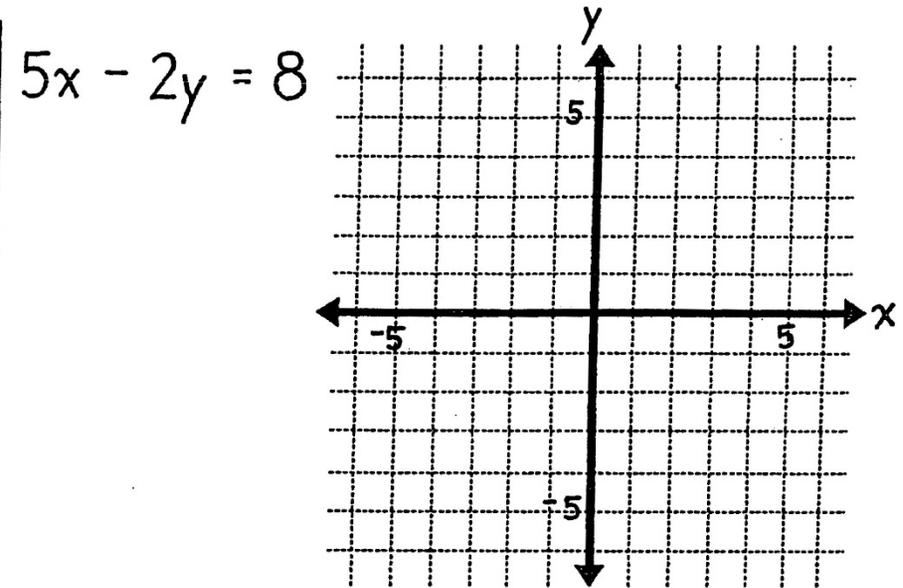
Standard Form

$$3x + 2y = 3$$

Solve each equation for y . Write the slope and y -intercept. Then use these to graph the equation.



$m =$ _____ $b =$ _____



$m =$ _____ $b =$ _____

POINT-SLOPE FORM of a Linear Equation

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

To use the point-slope form, you need
two things:

m = the slope

(x_1, y_1) = any given point

Example

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

- a) Write an equation in point-slope form of the line that passes through the point $(-2,4)$ with a slope of 3.

Example

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

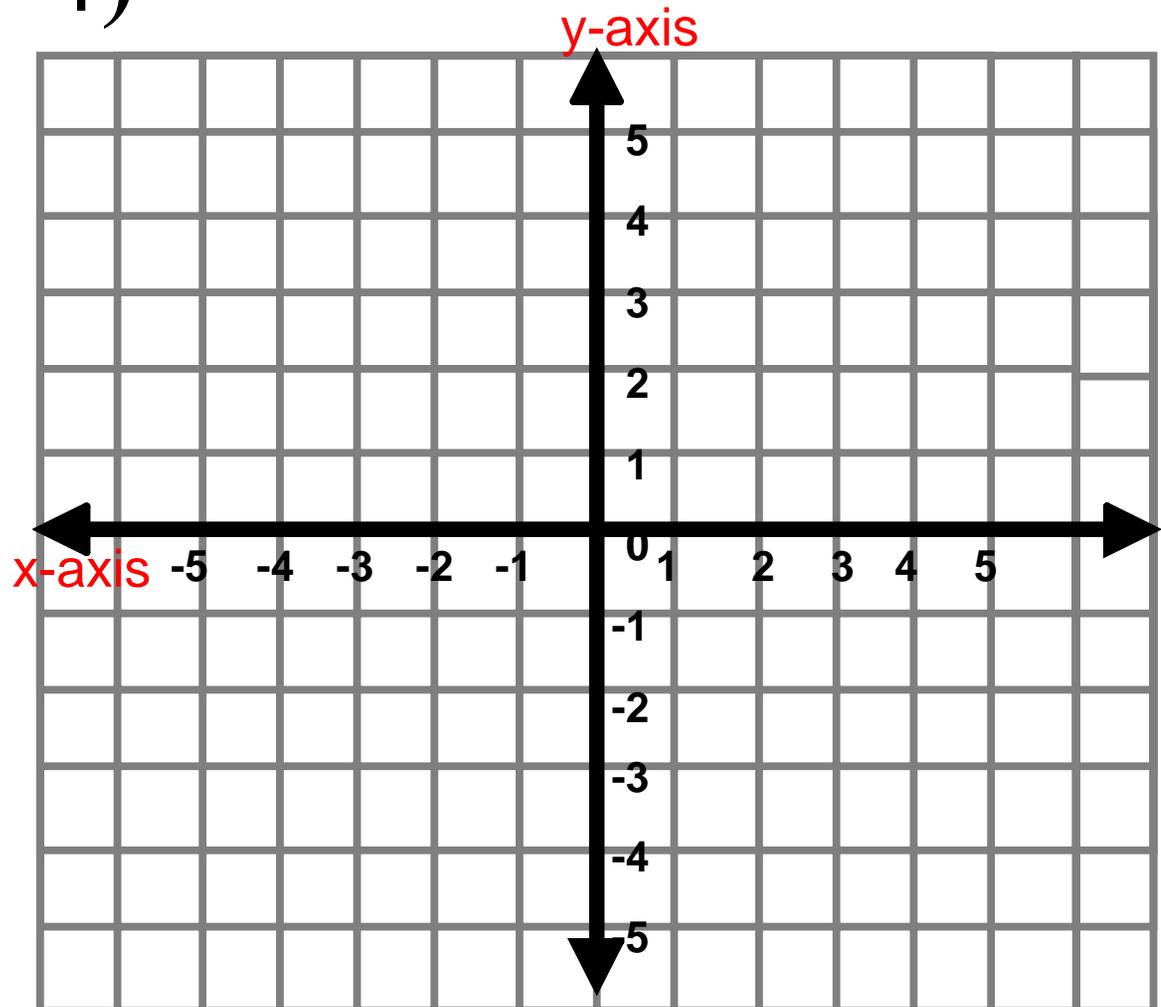
- b) Write an equation in point-slope form of the line that passes through the point (5,-2) with a slope of -4.

Example

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

c) Graph the equation

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

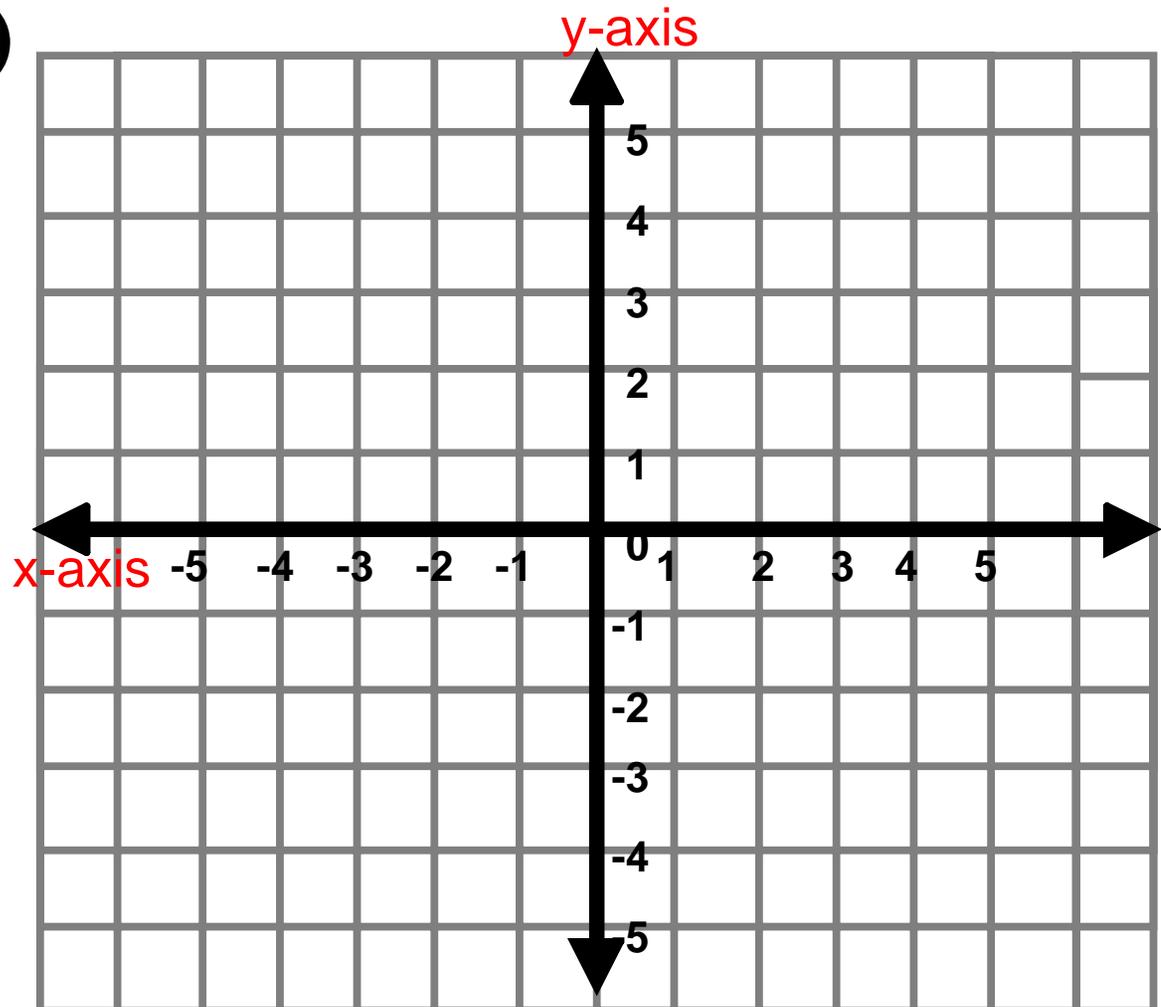


Example

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

d) Graph the equation

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



Example

- e) Write an equation of the line the graph in point-slope form.

