

Lesson 4.6 Writing Equations in Slope-Intercept Form

Learning Targets:

- Write an equation from a graph
- Write an equation given two points

a. $(0, 3)$ $(2, -4)$

★ b. $(-2, 3)$ $(6, 5)$

Slope-Intercept Form

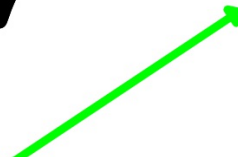

$$y = mx + b$$

$$y = -6x - 5$$

What Makes an Equation?

Slope-Intercept Form

$$y = mx + b$$

slope  

You need values for **m** and **b**
(y and x will remain variables)

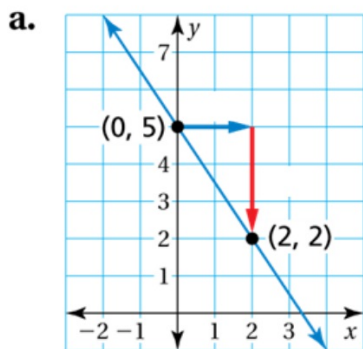
$$y = \overset{\text{slope}}{m}x + \overset{\text{y-intercept}}{b}$$

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

← This is what an
equation should
look like!

Write an Equation from a Graph

Write an equation of the line in slope-intercept form.

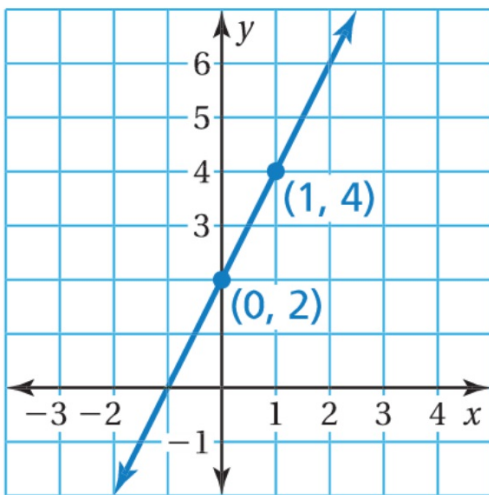


$$y = mx + b$$

slope $m = -\frac{3}{2}$ y-intercept $b = 5$

Equation: $y = -\frac{3}{2}x + 5$

Write an Equation from a Graph



$$y = mx + b$$

$$m = 2 \quad b = 2$$

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

or

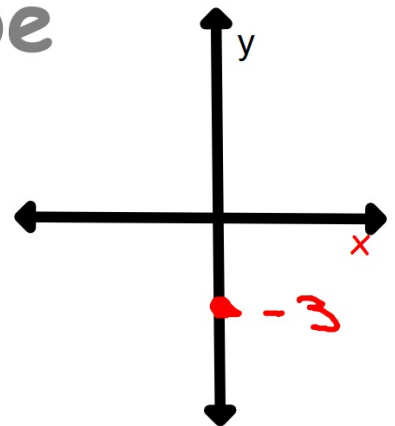
$$y = 2x + 2$$

Write an equation of a line
through the points $(0, -3)$ and $(-6, 6)$

Remember:

The y -intercept can be
found when $x = 0$

So the point $(0, -3)$
tells us that $b = -3$



Write an equation of a line
through the points $(0, -3)$ and $(-6, 6)$

$$y = mx + b$$

$$m = -\frac{3}{2} \quad b = -3$$

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

or

$$\frac{-3}{2}$$

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

$$\frac{6 - (-3)}{-6 - 0} = \frac{9}{-6} = -\frac{3}{2}$$

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

Write an equation of a line
through the points $(-8, 6)$ and $(-2, 9)$

x_1, y_1 x_2, y_2

Step 1: Find the Slope

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{9 - 6}{-2 - (-8)} = \frac{3}{6} = \frac{1}{2}$$

Step 2: Substitute to Solve for the y-intercept

Use Slope and 1 Coordinate point $y = mx + b$

$$y = mx + b$$

$m = \frac{1}{2}$ choose $(-2, 9)$

$$9 = \frac{1}{2}(-2) + b$$

$$9 = -1 + b$$

$$\begin{array}{r} +1 \\ +1 \end{array}$$

$$10 = b$$

$$y = \frac{1}{2}x + 10$$

$(-8, 6)$
 $m = \frac{1}{2}$

$$6 = \frac{1}{2}(-8) + b$$

$$6 = -4 + b$$

$$\begin{array}{r} +4 \\ +4 \end{array}$$

$$10 = b$$

Write an equation of a line
through the points $(-4, 2)$ and $(-6, 4)$

pt 1 pt 2
 x_1 y_1 x_2 y_2
 $\frac{2-4}{-4-(-6)} = \frac{-2}{2}$

Step 1: Find the Slope

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - 2}{-6 - (-4)} = \frac{2}{-2} = -1$$

Step 2: Substitute to Solve for the y-intercept

$(-4, 2)$ $m = -1$

$$y = mx + b$$

$$2 = -1(-4) + b$$

$$2 = 4 + b$$

$$\underline{-4 \quad -4}$$

$$b = -2$$

$$y = -1x - 2$$

Write an equation of a line through the points
(-2, -6) and (3, -1) using a Graph

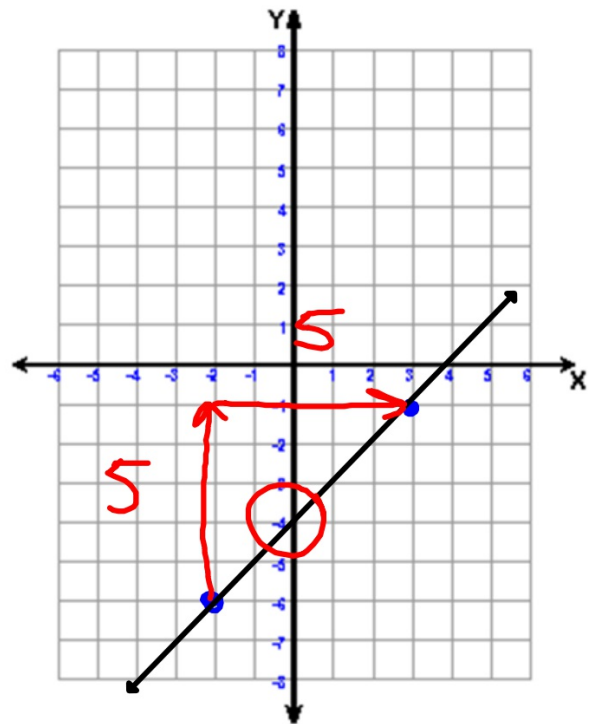
Graph the two points

- Find the slope
- Find the y-intercept

$$m = \frac{5}{5} \text{ or } 1$$

$$b = -4$$

$$y = 1x - 4$$

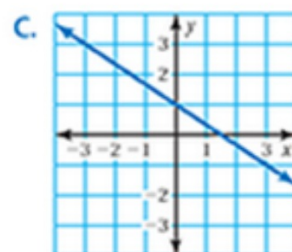
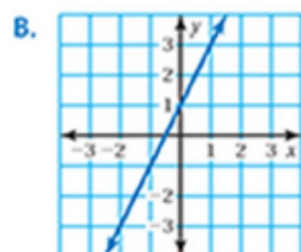
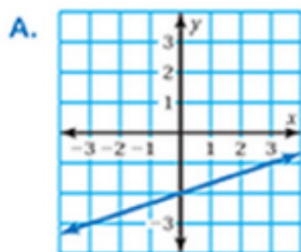


Match the Equation with its Graph.

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

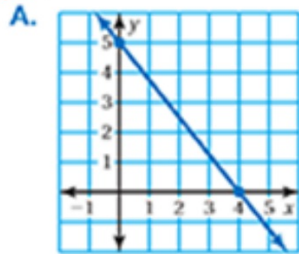
16. B $y = 2x + 1$

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



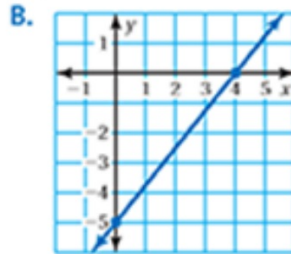
Match the equation with its graph.

B $15x - 12y = 60$



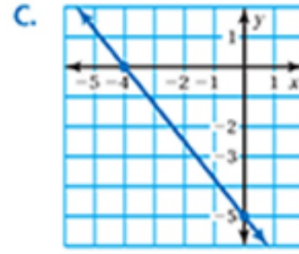
$x \text{ int} = 4$
 $y \text{ int} = -5$

A $5x + 4y = 20$



$x \text{ int} = 4$
 $y = 5$

C $10x + 8y = -40$



Homework

Text Pg 182

Book # 5-12

And Write the equation of
the line through the points

Copy These Down!

$$y = mx + b$$

1. $(0, 7), (1, 9)$

2. $(4, 3), (6, -3)$

3. $(2, -2), (4, -8)$