

Warm Up

February 8, 2019

1.) Solve the equation for  $y$ :  $3x + 2y = 7$ .

$$\begin{array}{r} 3x + 2y = 7 \\ -3x \phantom{+ 2y} = -3x \\ \hline 2y = -3x + 7 \\ \frac{2y}{2} = \frac{-3x + 7}{2} \end{array}$$

$$y = -\frac{3}{2}x + \frac{7}{2}$$

2.) Given  $f(x) = (x/4) + 7$ , find  $x$  when  $f(x) = 12$ .

$$\frac{12}{-7} = \frac{x}{4} + 7$$

$$5 = \frac{x}{4}$$

$$x = 20$$

3.) Find the slope from the representations below:

$(2, 5)$  and  $(2, -7)$

$$m = \frac{-7 - 5}{2 - 2} = \frac{-12}{0}$$

$$m = \text{undef.}$$

x	-9	-6	-3	0	3	6	9	12
y	-2	0	2	4	6	8	10	12

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

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

Match the function to the table of values.

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

$y = x - 7$   
m b  
 $-10 = -3 - 7$   
 $-10 = -10$

$y = \frac{1}{2}x + 2$   
 $-5 = \frac{1}{2}(2) + 2$   
 $-5 = 1 + 2$   
 $-5 = 3$

$y = -3x + 1$

A.

x	-3	-1	2	6
y	-10	-8	-5	-1

B.

x	-1	2	3	5
y	4	-5	-8	-14

C.

x	-3	0	3	9
y	2	4	6	10

D.

x	-2	2	4	6
y	1	3	4	5

## GOING BACKWARDS

Sometimes you must complete the ordered pairs using a given slope.

**Example:** If the slope of the line passing through the points  $(-5, 6)$  and  $(5, y)$  is  $-\frac{4}{5}$ , find  $y$ .

$$m = \frac{y_2 - y_1}{x_2 - x_1} \quad \begin{matrix} x_1 & y_1 & x_2 & y_2 \\ (-5, & 6) & (5, & y) \end{matrix}$$

$$-\frac{4}{5} = \frac{y-6}{5-(-5)}$$

~~$$-\frac{4}{5} = \frac{y-6}{10}$$~~

$$5(y-6) = -40$$

$$5y - 30 = -40$$

$$\begin{array}{r} +30 \quad +30 \\ \hline 5y = -10 \\ \frac{5y}{5} = \frac{-10}{5} \end{array}$$

$$y = -2$$

$x_1$   $y_1$   $x_2$   $y_2$

13.  $(-3, -2)$  and  $(x, 6)$ ;  $m = 2$

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

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

~~$$2 = \frac{8}{x+3}$$~~

$$2(x+3) = 8$$

$$2x + 6 = 8$$

$$\begin{array}{r} -6 \\ -6 \end{array}$$

$$\hline 2x = 2$$

$$\begin{array}{r} 2 \\ 2 \end{array}$$
$$x = 1$$

$x_1$   $y_1$   $x_2$   $y_2$

14.  $(0, -4)$  and  $(x, -7)$ ;  $m = \frac{3}{2}$

$$\frac{3}{2} = \frac{-7 - (-4)}{x - 0}$$

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

$$\frac{3x}{3} = \frac{-6}{3}$$

$$x = -2$$

15.  $(-3, -4)$  and  $(-5, y)$ ;  $m = -\frac{9}{2}$

$$\frac{-9}{2} = \frac{y+4}{-5-(-3)}$$

~~$$\frac{-9}{2} = \frac{y+4}{2}$$~~

$$18 = 2(y+4)$$

$$\begin{array}{r} 18 = 2y + 8 \\ -8 \quad -8 \\ \hline 10 = 2y \end{array}$$

$$\begin{array}{r} 10 = 2y \\ \hline y = 5 \end{array}$$

16.  $(x, 2)$  and  $(6, 3)$ ;  $m = -\frac{1}{2}$

$$\frac{-1}{2} = \frac{3-2}{6-x}$$

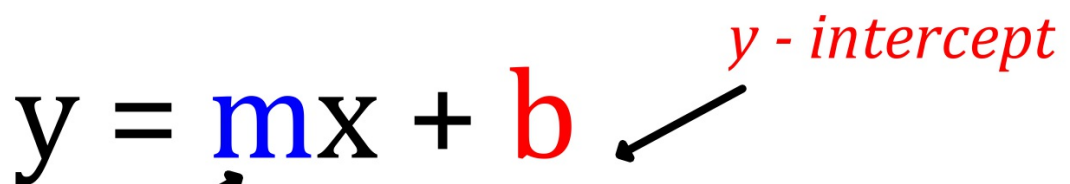
~~$$\frac{-1}{2} = \frac{1}{6-x}$$~~

$$-1(6-x) = 2$$

$$\begin{array}{r} -6 + x = 2 \\ +6 \quad +6 \\ \hline x = 8 \end{array}$$

$$x = 8$$

## *Slope Intercept Form*

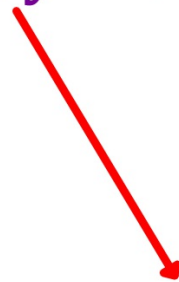
$$y = mX + b$$
The equation  $y = mX + b$  is displayed. The coefficient  $m$  is colored blue, and the constant  $b$  is colored red. A black arrow points from the blue  $m$  down to the blue text below. Another black arrow points from the red  $b$  down to the red text above.

*y - intercept*

*slope- always the coefficient paired with the x!*

## Standard Form

$$ax + by = c$$



y is still the most important  
term

Equations written in standard form can be converted to slope-intercept form by solving for y!

Write each equation in slope-intercept form.

Identify the slope and y-intercept.

$$\begin{array}{r} 1.) \quad 2x + y = 3 \\ \quad \quad \quad \underline{-2x \quad \quad -2x} \\ \quad \quad \quad y = \underline{-2x} + \underline{3} \\ \quad \quad \quad \underline{m} = -2 \\ \quad \quad \quad \underline{b} = 3 \end{array}$$

$$\begin{array}{r} 2.) \quad 4x + 5y = -30 \\ \quad \quad \quad \underline{-4x \quad \quad -4x} \\ \quad \quad \quad \frac{5y}{5} = \frac{-4x}{5} - \frac{30}{5} \\ \quad \quad \quad y = \left(\frac{-4}{5}\right)x - 6 \\ \quad \quad \quad m = \frac{-4}{5} \quad b = -6 \end{array}$$



$$\begin{aligned}
 3.) \quad & \frac{x}{-x} - \frac{3y}{-x} = \frac{12}{-x} \\
 & \frac{3y}{-3} = \frac{-x+12}{-3} \\
 & y = \frac{1}{3}x - 4 \\
 & m = \frac{1}{3} \quad b = -4
 \end{aligned}$$

$$5.) \quad 4x - y = 0$$

$$\begin{aligned}
 4.) \quad & \frac{x}{-x} - \frac{y}{-x} = \frac{-8}{-x} \\
 & \frac{-y}{-1} = \frac{-x-8}{-1} \\
 & y = x + 8 \\
 & m = 1 \quad b = 8
 \end{aligned}$$

$$6.) \quad 3x - 2y = -14$$