Converting Between Slope Intercept & Standard Form

In the last unit, you reviewed how to solve for y. When you graph linear functions, it is much easier to graph in slope intercept form than standard form.

Standard Form	Slope Intercept Form
$Ax + By = C$	$y = mx + b$
a, b, and c are constants	m = slope
	b = y-intercept

Solve the equations for y. Then name the slope and y-intercept.

A. $3x - 2y = -16$

$-3x \qquad -3x$

$\dfrac{-2y}{-2} = \dfrac{-16}{-2} - \dfrac{3x}{-2}$

$y = mx + b$

$y = 8 + \dfrac{3}{2}x \implies y = \dfrac{3}{2}x + 8$

Slope: $\dfrac{3}{2}$ (m)   y-intercept: 8 (b)
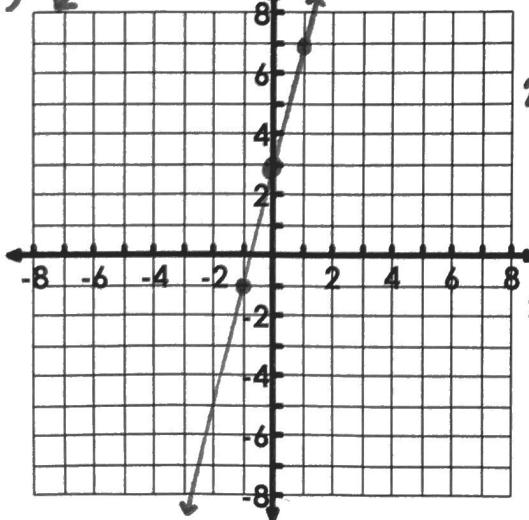
B. $5x - y = 10$

$-5x \qquad -5x$

$\dfrac{-y}{-1} = \dfrac{10}{-1} - \dfrac{5x}{-1}$

$y = mx + b$

$y = -10 + 5x \implies y = 5x - 10$

Slope: $\dfrac{5}{1}$ (m)   y-intercept: -10 (b)

C. $4x - y = -3$

$-4x \qquad -4x$

$\dfrac{-y}{-1} = \dfrac{-3}{-1} - \dfrac{4x}{-1}$

$y = mx + b$

$y = 3 + 4x \implies y = 4x + 3$

(+) $m = \dfrac{4}{1}$ $b = 3 \implies (0,3)$

D. $5y + 2x = 20$

$-2x \qquad -2x$

$\dfrac{5y}{5} = \dfrac{20}{5} - \dfrac{2x}{5}$

$y = mx + b$

$y = 4 - \dfrac{2}{5}x \implies y = \dfrac{-2}{5}x + 4$

(-) $m = \dfrac{-2}{5}$ $b = 4 \implies (0,4)$
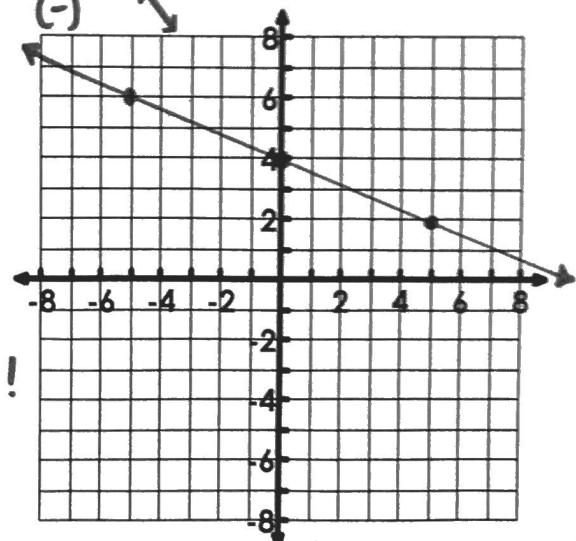
1.) Graph y-int

2) Use slope to graph two additional points.

3) Connect dots to draw line!

$\dfrac{rise}{run} = \dfrac{+4}{+1} = \dfrac{up\ 4}{right\ 1}$ OR $\dfrac{down\ 4}{left\ 1}$

$\dfrac{rise}{run} = \dfrac{-2}{+5} = \dfrac{down\ 2}{right\ 5}$ OR $\dfrac{up\ 2}{left\ 5}$

Converting from Slope Intercept to Standard Form

When converting from slope intercept form to standard form, you want to move your equation around so that the variables x and y are on the same side and the constant is on the other side. Additionally the standard form of an equation should not have the 'x' term be negative so you might have to multiply the entire equation (both sides) by -1. **or divide by -1**

Things to Remember about Standard Form

- $Ax + By = C \rightarrow A$, B, and C are integers
- No fractions
- A should be positive

Convert the following equations to slope intercept form:

a. $y = -3x + 2$

$$y = -3x + 2$$
$$+3x \quad +3x$$
$$\overline{y + 3x = 2} \implies 3x + 1y = 2 \qquad Ax + By = C$$

b. $y = 5x + 4$

$$y = 5x + 4$$
$$-5x \quad -5x$$
$$\overline{y - 5x + 4} \implies \frac{-5x + 1y}{-1} = \frac{4}{-1} \qquad Ax + By = C$$
$$5x - 1y = -4$$

c. $y = 7x - 3$

$$y = 7x - 3$$
$$-7x \quad -7x$$
$$\overline{y - 7x = -3} \implies \frac{-7x + y}{-1} = \frac{-3}{-1} \qquad Ax + By = C$$
$$7x - y = 3$$

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

$$y = -\frac{2}{3}x + 4$$
$$+\frac{2}{3}x \quad +\frac{2}{3}x$$
$$\overline{y + \frac{2}{3}x = 4} \implies \frac{2}{3}x + y = 4 \qquad Ax + By = C$$

e. $y = \frac{5}{3}x - 3$

$$y = \frac{5}{3}x - 3$$
$$-\frac{5}{3}x \quad -\frac{5}{3}x$$
$$\overline{y - \frac{5}{3}x = -3} \implies \frac{-\frac{5}{3}x + y = -3}{-1} \qquad Ax + By = C$$
$$\frac{5}{3}x - y = 3$$

f. $y = \frac{1}{2}x - 6$

$$y = \frac{1}{2}x - 6$$
$$-\frac{1}{2}x \quad -\frac{1}{2}x$$
$$\overline{y - \frac{1}{2}x = -6} \implies \frac{-\frac{1}{2}x + y}{-1} = \frac{-6}{-1} \qquad Ax + By = C$$
$$\frac{1}{2}x - y = 6$$