

What's Going On?

Checking In

Minds on

Standard Form Review

Action!

Intercepts

Consolidation

Graphing with Intercepts

Learning Goal - I will be able to graph lines in Standard Form using intercepts.

Minds on

Standard Form Review

Find the slope and y-intercept of the line in standard form below.

$$3x - 4y + 5 = 0$$

1. First, we move every term except the term with the **y** in it to the **right side**.

$$\begin{array}{r} \cancel{3x} - \boxed{-4y} + \cancel{5} = 0 \\ -3x \quad +5 \quad -3x - 5 \\ -4y = -3x - 5 \end{array}$$

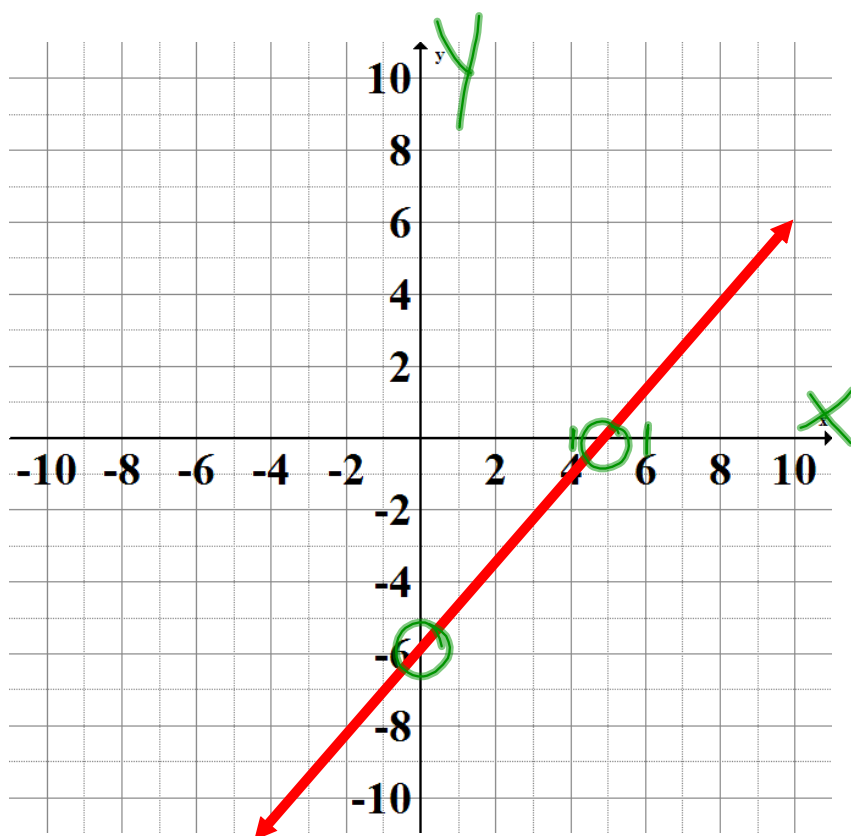
2. Next, we divide every term by the coefficient on y to get y by itself.

$$\frac{-4y}{-4} = \frac{-3x}{-4} - \frac{5}{-4}$$

$$y = \frac{3}{4}x + \frac{5}{4}$$

$$\begin{array}{l} \text{slope} = \frac{3}{4} \\ \text{y-intercept} = \frac{5}{4} \end{array}$$

Intercepts



x-Intercept

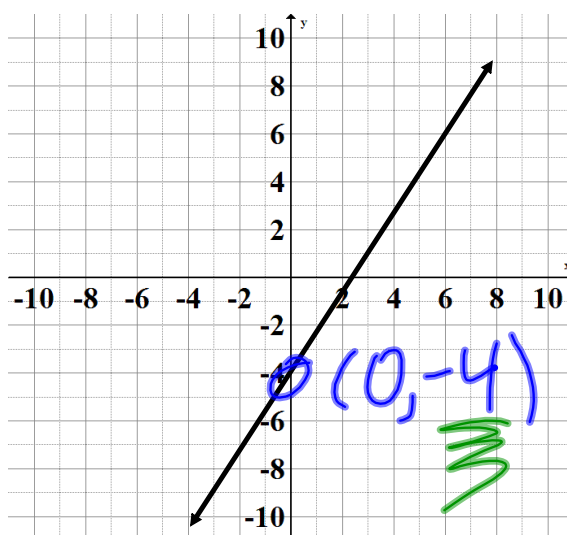
$$x = 5$$

y-Intercept

$$y = -6$$

Action!

y-intercept

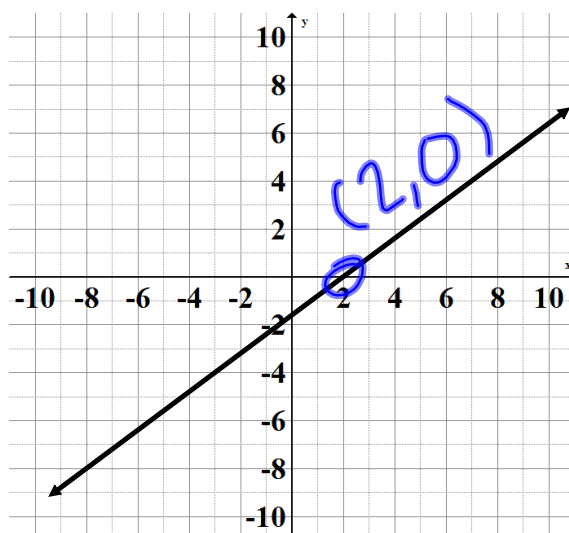


The y-intercept of a line is the y-coordinate of the point where a line crosses the y-axis.

At the y-intercept, $x = 0$.

Action!

x-intercept



The x-intercept of a line is the x-coordinate of the point where a line crosses the x-axis.

At the x-intercept, $y = 0$.

Action!

Intercepts

Find the x-intercept and y-intercept of the line below.

$$4x + 6y - 48 = 0$$

x-intercept = 12

To find the x-intercept

1. Sub in 0 for y.

$$4x + 6(0) - 48 = 0$$

2. Solve for x.

$$\begin{array}{r} 4x - 48 = 0 \\ \quad +48 \quad +48 \\ \hline 4x = 48 \\ \quad \underline{4} \quad \underline{4} \\ x = 12 \end{array}$$

y-intercept = 8

To find the y-intercept

1. Sub in 0 for x.

$$4(0) + 6y - 48 = 0$$

2. Solve for y.

$$\begin{array}{r} 6y - 48 = 0 \\ \quad +48 \quad +48 \\ \hline 6y = 48 \\ \quad \underline{6} \quad \underline{6} \\ y = 8 \end{array}$$

Whiteboards!

Action!

Applying Intercepts Cnt'd

Determine the slope of the line whose x-intercept is -4 and y-intercept is -6.

Remember that we can find the slope of a line given two points.

We just have to use the formula: $m = \frac{y_2 - y_1}{x_2 - x_1}$

Where (x_1, y_1) and (x_2, y_2) are our two points!

Determine the slope of the line through the following two points.

$$\begin{matrix} x_1 & y_1 \\ (2, & 5) \end{matrix}$$

$$\begin{matrix} x_2 & y_2 \\ (4, & 8) \end{matrix}$$

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

$$m = \frac{8 - 5}{4 - 2}$$

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

$$\textcircled{1} \begin{matrix} x_1 & y_1 \\ (1, -3) \end{matrix}$$

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

$$\textcircled{2} \begin{matrix} x_2 & y_2 \\ (-4, 2) \end{matrix}$$

$$m = \frac{(2) - (-3)}{(-4) - (1)}$$

$$m = \frac{5}{-5}$$

$$m = -1$$

Find the slope of the line through these two points:

$$\begin{matrix} x_1 & y_1 \\ (-3, & -4) \end{matrix}$$

$$\frac{-4}{8} = \frac{-2}{4} = \frac{-1}{2}$$

$$\begin{matrix} x_2 & y_2 \\ (5, & -8) \end{matrix}$$

$$\frac{(-8) - (-4)}{(5) - (-3)}$$

$$= \frac{-4}{8}$$

Action!

Applying Intercepts Cnt'd

Determine the slope of the line whose x-intercept is -4 and y-intercept is -6.

In this case our points are the x-intercept and the y-intercept.

At the x-intercept, $y = 0$. So one of our points is $(-4, 0)$

At the y-intercept, $x = 0$. So our other point is $(0, -6)$

Consolidation

Graphing Using Intercepts

Graph the line below by first finding the x- and y-intercepts.

$$3x - 5y + 15 = 0$$

1. Find the x-intercept and y-intercept.
2. Plot the intercepts.
3. Draw the line connecting the two points.

$$3x - 5y + 15 = 0$$

1. Find the x-intercept and y-intercept.

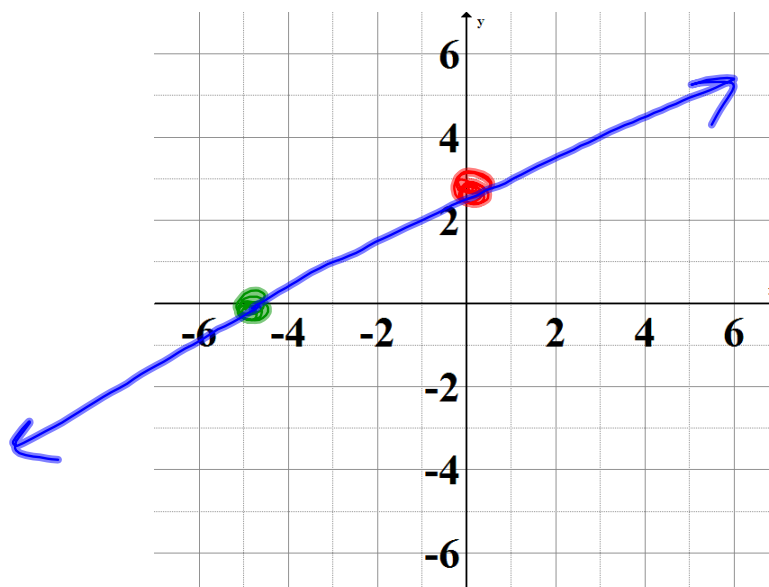
x-intercept

$$\begin{aligned} 3x + 15 &= 0 \\ -15 &-15 \\ \hline 3x &= -15 \\ \frac{3x}{3} &= \frac{-15}{3} \\ x &= -5 \end{aligned}$$

y-intercept

$$\begin{aligned} -5y + 15 &= 0 \\ -15 &-15 \\ \hline -5y &= -15 \\ \frac{-5y}{-5} &= \frac{-15}{-5} \\ y &= 3 \end{aligned}$$

2. Plot the intercepts.
3. Draw the line connecting the two points.



Consolidation

Practice it!

Page 319
#1-5, 8