

4.3

Graph Using Intercepts

Goal • Graph a linear equation using intercepts.

Your Notes

VOCABULARY

x-intercept The x -coordinate of a point where a graph crosses the x -axis

y-intercept The y -coordinate of a point where a graph crosses the y -axis

Example 1 Find the intercepts of the graph of an equation

Find the x -intercept and the y -intercept of the graph of $8x - 2y = 32$.

Solution

1. Substitute 0 for y and solve for x .

$$8x - 2y = 32$$

Write original equation.

$$8x - 2(\underline{0}) = 32$$

Substitute 0 for y .

$$x = \frac{\boxed{32}}{\boxed{8}} = \underline{4}$$

Solve for x .

2. Substitute 0 for x and solve for y .

$$8x - 2y = 32$$

Write original equation.

$$8(\underline{0}) - 2y = 32$$

Substitute 0 for x .

$$y = \frac{\boxed{32}}{\boxed{-2}} = \underline{-16}$$

Solve for y .

The x -intercept is 4. The y -intercept is -16.

Your Notes

✓ **Checkpoint** Find the x-intercept and y-intercept of the graph of the equation.

1. $2x + 3y = 18$

x-intercept: 9

y-intercept: 6

2. $-12x - 4y = 36$

x-intercept: -3

y-intercept: -9

Example 2 Use intercepts to graph an equation

Graph $3.5x + 2y = 14$. Label the points where the line crosses the axis.

Solution

Step 1 Find the intercepts.

$$3.5x + 2y = 14$$

$$3.5x + 2(\underline{0}) = 14$$

$$x = \frac{\boxed{14}}{\boxed{3.5}} = \underline{4}$$

$$3.5x + 2y = 14$$

$$3.5(\underline{0}) + 2y = 14$$

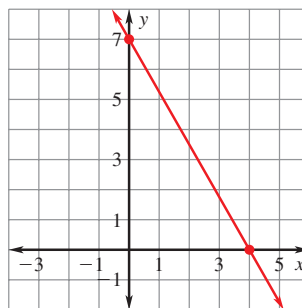
$$y = \frac{\boxed{14}}{\boxed{2}} = \underline{7}$$

Step 2 Plot the points that correspond to the intercepts.

The x-intercept is 4, so plot the point (4, 0).

The y-intercept is 7, so plot the point (0, 7).

Step 3 Connect the points by drawing a line through them.



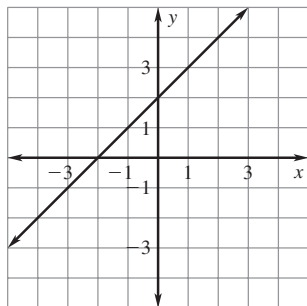
CHECK

You can check the graph of the equation by using a third point. When $x = 2$, $y = \underline{3.5}$, so the ordered pair (2, 3.5) is a third solution of the equation. You can see that (2, 3.5) lies on the graph, so the graph is correct.

Your Notes

Example 3 Use a graph to find the intercepts

Identify the x -intercept and y -intercept of the graph.

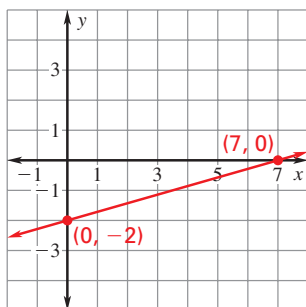


Solution

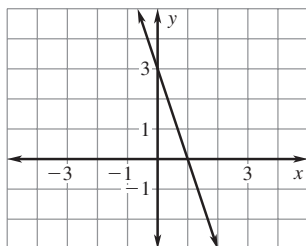
To find the x -intercept, look to see where the graph crosses the x -axis. The x -intercept is -2 . To find the y -intercept, look to see where the graph crosses the y -axis. The y -intercept is 2 .

✓ **Checkpoint** Complete the following exercises.

3. Graph $2x - 7y = 14$. Label the points where the line crosses the axes.



4. Identify the x -intercept and y -intercept of the graph.



x -intercept = 1

y -intercept = 3

Homework