

4.3

Graph Using Intercepts (Special Points)

- Goal** • Graph a linear equation using intercepts.
2nd method

Your Notes

VOCABULARY

x-intercept - point where graph of the function touches/crosses x-axis
 $(x, 0)$

y-intercept - point where the graph touches or crosses the y-axis.
 $(0, y)$

$$Ax + By = C$$

Example 1 Find the intercepts of the graph of an equation

Find the x-intercept and the y-intercept of the graph of $8x - 2y = 32$. → Standard form $A=8$ $B=-2$ $C=32$

Solution x-int.

1. Substitute 0 for y and solve for x .

$$8x - 2y = 32$$

$$8x - 2(0) = 32$$

$$8x = 32$$

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

2. Substitute 0 for x and solve for y .

$$8x - 2y = 32$$

$$8(0) - 2y = 32$$

$$-2y = 32$$

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

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

x-int. $(4, 0)$ y-int. $(0, -16)$

x	y	
0	-16	$(0, -16)$
4	0	$(4, 0)$

Write original equation.

Substitute 0 for y .

Solve for x . $(4, 0)$

Write original equation.

Substitute 0 for x .

Solve for y . $(0, -16)$

Your Notes

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

1. $2x + 3y = 18$	2. $-12x - 4y = 36$
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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 x/y intercepts

x-int.
 $3.5x + 2y = 14$
 $3.5x + 2(0) = 14$
 $3.5x = 14$
 $x = \frac{14}{3.5} = 4$
 (4, 0)

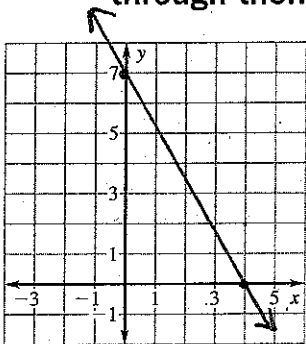
y-int.
 $3.5x + 2y = 14$
 $3.5(0) + 2y = 14$
 $2y = 14$
 $y = \frac{14}{2} = 7$ (0, 7)

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

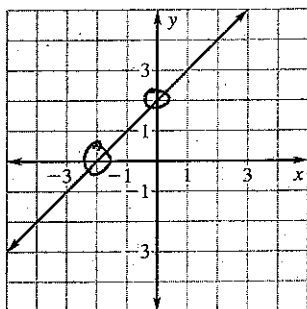
You can check the graph of the equation by using a third point. When $x = 2$, $y =$ 1, so the ordered pair (2, 1) is a third solution of the equation. You can see that (2, 1) lies on the graph, so the graph is correct.

Your Notes

Example 3

Use a graph to find the intercepts

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



$(0, 2)$

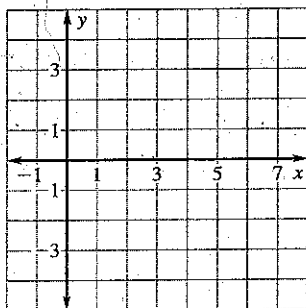
$(-2, 0)$

Solution

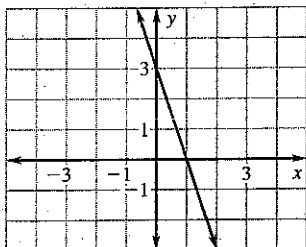
To find the x-intercept, look to see where the graph crosses the x-axis. The x-intercept is $(-2, 0)$. To find the y-intercept, look to see where the graph crosses the y-axis. The y-intercept is $(0, 2)$.

✓ **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.



Homework