

5-5 Reteaching

Standard Form

The **standard form** of a linear equation is $Ax + By = C$, where A , B , and C are real numbers, and A and B are not both zero. You can easily determine the x - and y -intercepts of the graph from this form of the equation.

Each intercept occurs when one coordinate is 0. When substituting 0 for either of x or y , one of the terms on the left side of the standard form equation disappears. This leaves a linear equation in one variable, with a variable term on the left and a constant on the right. Determining the other coordinate of the intercept requires only multiplication or division.

Problem

What are the x - and y -intercepts of the graph of $6x - 9y = 18$?

First find the x -intercept.

$$\begin{array}{ll} 6x - 9y = 18 & \\ 6x - 9(0) = 18 & \text{Substitute 0 for } y. \\ 6x = 18 & \text{Simplify.} \\ x = 3 & \text{Divide each side by 6.} \end{array}$$

Then find the y -intercept.

$$\begin{array}{ll} 6x - 9y = 18 & \\ 6(0) - 9y = 18 & \text{Substitute 0 for } x. \\ -9y = 18 & \text{Simplify.} \\ y = -2 & \text{Divide each side by } -9. \end{array}$$

The x -intercept is 3 and the y -intercept is -2 .

Exercises

Find the x - and y -intercepts of the graph of each equation.

1. $x - y = 12$

2. $3x + 2y = 12$

3. $-7x + 3y = 42$

4. $8x - 6y = 24$

5. $5x - 4y = -40$

6. $-4x + y = 28$

7. $6x + 3y = -30$

8. $7x - 2y = 28$

9. $8x + 2y = -32$

10. Write an equation in standard form with an x -intercept of 5 and a y -intercept of -4 .

5-5 Reteaching (continued)

Standard Form

You can graph linear equations in standard form by plotting the x - and y -intercepts.

Problem

What is the graph of $2x - y = 4$?

Find the intercepts.

$$2x - y = 4$$

$$2x - (0) = 4$$

$$2x = 4$$

$$x = 2$$

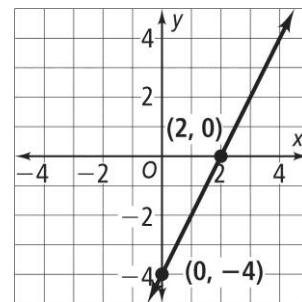
$$2x - y = 4$$

$$2(0) - y = 4$$

$$-y = 4$$

$$y = -4$$

The x -intercept is 2, and the y -intercept is -4 . Plot the x - and y -intercepts and draw a line through the points.



Exercises

Graph each equation using x - and y -intercepts.

11. $x + y = 3$

12. $2x - 3y = 6$

13. $x + 2y = -4$

14. $-3x + 4y = 12$

15. $5x - 3y = 15$

16. $5x + 2y = -10$