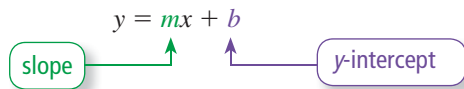
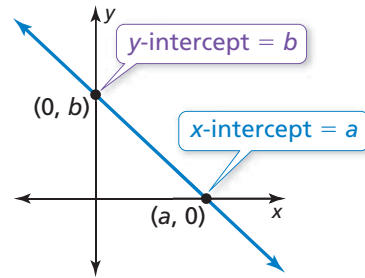


# Slope-Intercept Form

The **x-intercept** of a line is the  $x$ -coordinate of the point where the line crosses the  $x$ -axis. It occurs when  $y = 0$ .

The **y-intercept** of a line is the  $y$ -coordinate of the point where the line crosses the  $y$ -axis. It occurs when  $x = 0$ .

A linear equation written in the form  $y = mx + b$  is in **slope-intercept form**. The slope of the line is  $m$ , and the  $y$ -intercept of the line is  $b$ .



**Example 1** Identify the slope and the  $y$ -intercept of the graph of each linear equation.

a.  $y = -3x - 8$

$y = -3x + (-8)$  Write in slope-intercept form.

▶ The slope is  $-3$ , and the  $y$ -intercept is  $-8$ .

b.  $y - 4 = \frac{1}{3}x$

$y = \frac{1}{3}x + 4$  Add 4 to each side.

▶ The slope is  $\frac{1}{3}$ , and the  $y$ -intercept is  $4$ .

**Example 2** Find the  $x$ -intercept and the  $y$ -intercept of the graph of  $2x + y = 4$ .

To find the  $x$ -intercept, substitute 0 for  $y$  and solve for  $x$ .

$$\begin{aligned} 2x + y &= 4 \\ 2x + (0) &= 4 \\ x &= 2 \end{aligned}$$

▶ The  $x$ -intercept is 2, and the  $y$ -intercept is 4.

To find the  $y$ -intercept, substitute 0 for  $x$  and solve for  $y$ .

$$\begin{aligned} 2x + y &= 4 \\ 2(0) + y &= 4 \\ y &= 4 \end{aligned}$$

## Practice

Check your answers at [BigIdeasMath.com](http://BigIdeasMath.com).

Identify the slope and the  $y$ -intercept of the graph of the linear equation.

1.  $y = 4x + 7$

2.  $y = -\frac{1}{3}x + 8$

3.  $y = \frac{1}{9}x - 6$

4.  $y + 9 = -5x$

5.  $y - 2x = -6$

6.  $7 + y = -\frac{2}{3}x$

Find the  $x$ -intercept and the  $y$ -intercept of the graph of the equation.

7.  $y = 2x$

8.  $y = x + 8$

9.  $y = 3x + 6$

10.  $3x + y = 9$

11.  $2x + 3y = 12$

12.  $2x - 5y = 10$

13. **SHOPPING** The amount of money you spend on  $x$  books and  $y$  movies is given by the equation  $8x + 12y = 96$ . Find the intercepts of the graph of the equation. What do these values represent?