Writing Linear Equations in Slope-Intercept Form

The x-coordinate of the point where a line crosses the x-axis is called the **x-intercept.** Similarly, the y-coordinate of the point where the line crosses the y-axis is called the **y-intercept.**

Slope-Intercept Form of a Linear Equation
Given the slope m and the y-intercept b of a line, the slope-intercept form of an equation of the line is $$y = mx + b.$$

If an equation is given in standard form $Ax + By = C$ and B is not zero, the slope of the line is $-\dfrac{A}{B}$ and the y-intercept is $\dfrac{C}{B}$. The x-intercept is $\dfrac{C}{A}$ where $A \neq 0$.

Example: Find the x- and y-intercepts of the graph of $5x - 2y = 10$. Then write the equation in slope-intercept form.

Since $A = 5$, $B = -2$, and $C = 10$,

$$\frac{C}{A} = \frac{10}{5} \qquad \frac{C}{B} = \frac{10}{-2} \qquad m = -\frac{A}{B}$$
$$= 2 \qquad\qquad = -5 \qquad\qquad = \frac{5}{2}$$

Thus, the x-intercept is 2, and the y-intercept is -5. The equation of the line in slope-intercept form is
$$y = \frac{5}{2}x - 5.$$

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

1. $5x + 4y = 20$ **2.** $2x - 5y = -7$

3. $4x - 8y = 10$ **4.** $9x + y = -1$

Write an equation in slope-intercept form of a line with the given slope and y-intercept. Then write the equation in standard form.

5. $m = 6$, $b = 10$ **6.** $m = 4$, $b = 0$

7. $m = -1$, $b = 3$ **8.** $m = 2$, $b = -3$

Find the slope and y-intercept of the graph of each equation. Then write each equation in slope-intercept form.

9. $0.2x + 0.5y = 1.6$ **10.** $3x + 7y = 10$

11. $6x - y = 9$ **12.** $14x - 21y = 7$