5-5 **Study Guide and Intervention** *(continued)*

Writing Equations in Point-Slope Form

Forms of Linear Equations

Slope-Intercept Form	$y = mx + b$	m = slope; b = y-intercept
Point-Slope Form	$y - y_1 = m(x - x_1)$	m = slope; (x_1, y_1) is a given point.
Standard Form	$Ax + By = C$	A and B are not both zero. Usually A is nonnegative and A, B, and C are integers whose greatest common factor is 1.

Example 1 Write $y + 5 = \frac{2}{3}(x - 6)$ in standard form.

$$y + 5 = \frac{2}{3}(x - 6) \qquad \text{Original equation}$$

$$3(y + 5) = 3\left(\frac{2}{3}\right)(x - 6) \qquad \text{Multiply each side by 3.}$$

$$3y + 15 = 2(x - 6) \qquad \text{Distributive Property}$$
$$3y + 15 = 2x - 12 \qquad \text{Distributive Property}$$
$$3y = 2x - 27 \qquad \text{Subtract 15 from each side.}$$
$$-2x + 3y = -27 \qquad \text{Add } -2x \text{ to each side.}$$
$$2x - 3y = 27 \qquad \text{Multiply each side by } -1.$$

Therefore, the standard form of the equation is $2x - 3y = 27$.

Example 2 Write $y - 2 = -\frac{1}{4}(x - 8)$ in slope-intercept form.

$$y - 2 = -\frac{1}{4}(x - 8) \qquad \text{Original equation}$$

$$y - 2 = -\frac{1}{4}x + 2 \qquad \text{Distributive Property}$$

$$y = -\frac{1}{4}x + 4 \qquad \text{Add 2 to each side.}$$

Therefore, the slope-intercept form of the equation is $y = -\frac{1}{4}x + 4$.

Exercises

Write each equation in standard form.

1. $y + 2 = -3(x - 1)$

2. $y - 1 = -\frac{1}{3}(x - 6)$

3. $y + 2 = \frac{2}{3}(x - 9)$

4. $y + 3 = -(x - 5)$

5. $y - 4 = \frac{5}{3}(x + 3)$

6. $y + 4 = -\frac{2}{5}(x - 1)$

Write each equation in slope-intercept form.

7. $y + 4 = 4(x - 2)$

8. $y - 5 = \frac{1}{3}(x - 6)$

9. $y - 8 = -\frac{1}{4}(x + 8)$

10. $y - 6 = 3\left(x - \frac{1}{3}\right)$

11. $y + 4 = -2(x + 5)$

12. $y + \frac{5}{3} = \frac{1}{2}(x - 2)$