8-7 **Writing Linear Equations** *(Pages 404–408)*

To write an equation given the slope and one point	Use $y = mx + b$ for the equation. Replace m with the given slope and the coordinates of the given point for x and y. Solve the equation for the y-intercept, b. Rewrite the equation with the slope for m and the y-intercept for b.
To write an equation given two points	Use the slope formula to calculate m. Choose any of the two given points to use in place of x and y in $y = mx + b$. Replace m with the slope you just calculated. Solve for b. Rewrite the equation with the slope for m and the y-intercept for b.

Examples Write an equation in slope-intercept form from the given information.

a. The slope is 3 and the line passes through the point (5, 16).

$y = mx + b$ — Use slope-intercept form.
$y = 3x + b$ — Replace m with the slope.
$16 = 3 \cdot 5 + b$ — Replace x and y.
$1 = b$ — Solve for b.
$y = 3x + 1$ — Rewrite the equation.

b. The line passes through the points (10, −4) and (−7, 13).

$m = \dfrac{y_2 - y_1}{x_2 - x_1}$ — Use the slope formula.

$m = \dfrac{13 - (-4)}{-7 - 10}$ — Substitute.

$m = -1$ — Solve for m.

$y = mx + b$
$-4 = (-1)10 + b$ — Substitute m, x, and y.
$6 = b$ — Solve for b.
$y = -x + 6$ — Rewrite the equation.

Practice

Write an equation in slope-intercept form from the given information.

1. $m = 2, (6, 1)$ **2.** $m = \dfrac{1}{2}, (5, 6.5)$ **3.** $m = 1, (-5, -7)$ **4.** $m = -\dfrac{5}{4}, (-1, 8)$

5. $(3, 8), (5, 9)$ **6.** $(3, -4), (-6, -1)$ **7.** $(0, 7), (-2, 3)$ **8.** $(-10, 47), (5, -13)$

9. | Standardized Test Practice | Which is the correct slope-intercept equation for a line that passes through the points $(-15, -47)$ and $(-19, -59)$?

A $y = -3x + 2$ **B** $y = 3x + 2$ **C** $y = -3x - 2$ **D** $y = 3x - 2$

Answers: 1. $y = 2x - 11$ **2.** $y = \dfrac{1}{2}x + 4$ **3.** $y = x - 2$ **4.** $y = -\dfrac{5}{4}x + \dfrac{27}{4}$ **5.** $y = \dfrac{1}{2}x + \dfrac{13}{2}$ **6.** $y = -\dfrac{1}{3}x - 3$ **7.** $y = 2x + 7$ **8.** $y = -4x + 7$ **9.** D