

4-2 Study Guide and Intervention**Writing Equations in Slope-Intercept Form****Write an Equation Given the Slope and a Point**

Example 1 Write an equation of the line that passes through $(-4, 2)$ with a slope of 3.

The line has slope 3. To find the y -intercept, replace m with 3 and (x, y) with $(-4, 2)$ in the slope-intercept form. Then solve for b .

$$\begin{aligned} y &= mx + b && \text{Slope-intercept form} \\ 2 &= 3(-4) + b && m = 3, y = 2, \text{ and } x = -4 \\ 2 &= -12 + b && \text{Multiply.} \\ 14 &= b && \text{Add 12 to each side.} \end{aligned}$$

Therefore, the equation is $y = 3x + 14$.

Example 2 Write an equation of the line that passes through $(-2, -1)$ with a slope of $\frac{1}{4}$.

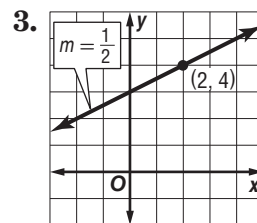
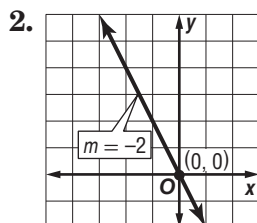
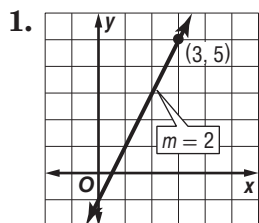
The line has slope $\frac{1}{4}$. Replace m with $\frac{1}{4}$ and (x, y) with $(-2, -1)$ in the slope-intercept form.

$$\begin{aligned} y &= mx + b && \text{Slope-intercept form} \\ -1 &= \frac{1}{4}(-2) + b && m = \frac{1}{4}, y = -1, \text{ and } x = -2 \\ -1 &= -\frac{1}{2} + b && \text{Multiply.} \\ -\frac{1}{2} &= b && \text{Add } \frac{1}{2} \text{ to each side.} \end{aligned}$$

Therefore, the equation is $y = \frac{1}{4}x - \frac{1}{2}$.

Exercises

Write an equation of the line that passes through the given point and has the given slope.



4. $(8, 2)$; slope $-\frac{3}{4}$

5. $(-1, -3)$; slope 5

6. $(4, -5)$; slope $-\frac{1}{2}$

7. $(-5, 4)$; slope 0

8. $(2, 2)$; slope $\frac{1}{2}$

9. $(1, -4)$; slope -6

10. $(-3, 0)$, $m = 2$

11. $(0, 4)$, $m = -3$

12. $(0, 350)$, $m = \frac{1}{5}$

4-2 Study Guide and Intervention *(continued)***Writing Equations in Slope-Intercept Form****Write an Equation Given Two Points****Example****Write an equation of the line that passes through (1, 2) and (3, -2).**Find the slope m . To find the y -intercept, replace m with its computed value and (x, y) with (1, 2) in the slope-intercept form. Then solve for b .

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Slope formula

$$m = \frac{-2 - 2}{3 - 1}$$

$$y_2 = -2, y_1 = 2, x_2 = 3, x_1 = 1$$

$$m = -2$$

Simplify.

$$y = mx + b$$

Slope-intercept form

$$2 = -2(1) + b$$

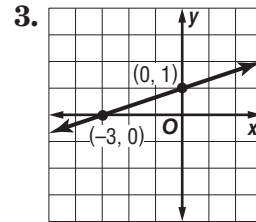
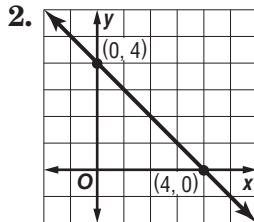
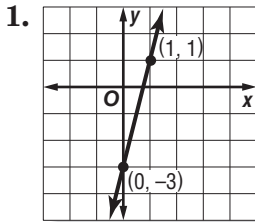
Replace m with -2 , y with 2 , and x with 1 .

$$2 = -2 + b$$

Multiply.

$$4 = b$$

Add 2 to each side.

Therefore, the equation is $y = -2x + 4$.**Exercises****Write an equation of the line that passes through each pair of points.**

4. $(-1, 6), (7, -10)$

5. $(0, 2), (1, 7)$

6. $(6, -25), (-1, 3)$

7. $(-2, -1), (2, 11)$

8. $(10, -1), (4, 2)$

9. $(-14, -2), (7, 7)$

10. $(4, 0), (0, 2)$

11. $(-3, 0), (0, 5)$

12. $(0, 16), (-10, 0)$