

USING TWO POINTS If you know the point where a line crosses the y -axis and any other point on the line, you can write an equation of the line.

EXAMPLE 3 Write an equation of a line given two points

Write an equation of the line shown.

Solution

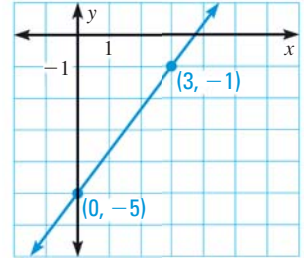
STEP 1 Calculate the slope.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-1 - (-5)}{3 - 0} = \frac{4}{3}$$

STEP 2 Write an equation of the line. The line crosses the y -axis at $(0, -5)$. So, the y -intercept is -5 .

$$y = mx + b \quad \text{Write slope-intercept form.}$$

$$y = \frac{4}{3}x - 5 \quad \text{Substitute } \frac{4}{3} \text{ for } m \text{ and } -5 \text{ for } b.$$



WRITING FUNCTIONS Recall that the graphs of linear functions are lines. You can use slope-intercept form to write a linear function.

EXAMPLE 4 Write a linear function

Write an equation for the linear function f with the values $f(0) = 5$ and $f(4) = 17$.

Solution

STEP 1 Write $f(0) = 5$ as $(0, 5)$ and $f(4) = 17$ as $(4, 17)$.

STEP 2 Calculate the slope of the line that passes through $(0, 5)$ and $(4, 17)$.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{17 - 5}{4 - 0} = \frac{12}{4} = 3$$

STEP 3 Write an equation of the line. The line crosses the y -axis at $(0, 5)$. So, the y -intercept is 5 .

$$y = mx + b \quad \text{Write slope-intercept form.}$$

$$y = 3x + 5 \quad \text{Substitute } 3 \text{ for } m \text{ and } 5 \text{ for } b.$$

► The function is $f(x) = 3x + 5$.

REVIEW FUNCTIONS

For help with using function notation, see p. 262.

GUIDED PRACTICE for Examples 3 and 4

3. Write an equation of the line shown.

Write an equation for the linear function f with the given values.

4. $f(0) = -2, f(8) = 4$

5. $f(-3) = 6, f(0) = 5$

