

5.1

Write Linear Equations in Slope-Intercept Form

Goal • Write equations of lines.

Your Notes

Use the slope-intercept form ($y = mx + b$) to write an equation of a line if slope and y-intercept are given.

Example 1 *Use slope and y-intercept to write an equation*

Write an equation of the line with a slope of -4 and a y-intercept of 6 .

Solution

$$y = mx + b$$

Write slope-intercept form.

$$y = \underline{\hspace{1cm}}x + \underline{\hspace{1cm}}$$

Substitute $\underline{\hspace{1cm}}$ for m and $\underline{\hspace{1cm}}$ for b .

✓ **Checkpoint** Write an equation of the line with the given slope and y-intercept.

1. Slope is 8 ;
y-intercept is -5 .

2. Slope is $\frac{2}{3}$;
y-intercept is -2 .

3. Slope is -3 ;
y-intercept is 7 .

4. Slope is $-\frac{5}{2}$;
y-intercept is 9 .

Your Notes

Example 2 Write an equation of a line given two points

Write an equation of the line shown.

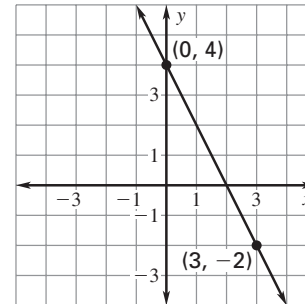
Solution

Step 1 Calculate the slope.

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

$$= \frac{\boxed{} - \boxed{}}{\boxed{} - \boxed{}}$$

$$= \frac{\boxed{}}{\boxed{}} = \underline{\hspace{2cm}}$$



You can write an equation of a line if you know the y-intercept and any other point on the line.

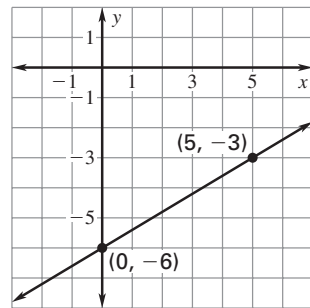
Step 2 Write an equation of the line. The line crosses the y-axis at _____. So, the y-intercept is _____.

$y = mx + b$ Write slope-intercept form.

$y = \underline{\hspace{1cm}}x + \underline{\hspace{1cm}}$ Substitute _____ for m and _____ for b .

Checkpoint Complete the following exercise.

5. Write an equation of the line shown.



Example 3 Write a linear function

Write an equation for the linear function f with the values $f(0) = 4$ and $f(2) = 12$.

Solution

Step 1 Write $f(0) = 4$ as _____ and $f(2) = 12$ as _____.

Step 2 Calculate the slope of the line that passes through _____ and _____.

$$\begin{aligned}
 m &= \frac{y_2 - y_1}{x_2 - x_1} \\
 &= \frac{\boxed{} - \boxed{}}{\boxed{} - \boxed{}} \\
 &= \frac{\boxed{}}{\boxed{}} \\
 &= \underline{\hspace{1cm}}
 \end{aligned}$$

Step 3 Write an equation of the line. The line crosses the y -axis at $(0, \underline{\hspace{1cm}})$. So, the y -intercept is $\underline{\hspace{1cm}}$.

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

$$y = \underline{\hspace{1cm}} \quad \text{Substitute } \underline{\hspace{1cm}} \text{ for } m \text{ and } \underline{\hspace{1cm}} \text{ for } b.$$

The function is $\underline{\hspace{1cm}}$.

✓ Checkpoint Complete the following exercise.

Homework

6. Write an equation for the linear function with the values $f(0) = 3$ and $f(3) = 15$.