

5.2

Use Linear Equations in Slope-Intercept Form

- Goal** • Write an equation of a line using points on the line.

Your Notes

WRITING AN EQUATION OF A LINE IN SLOPE-INTERCEPT FORM

Step 1 Identify the slope _____. You can use the _____ to calculate the slope if you know two points on the line.

Step 2 Find the _____. You can substitute the _____ and the _____ of a point (x, y) on the line into $y = mx + b$. Then solve for _____.

Step 3 Write an equation using _____.

Example 1 Write an equation given the slope and a point

Write an equation of the line that passes through the point $(1, 2)$ and has a slope of 3.

Solution

Step 1 Identify the slope. The slope is _____.

Step 2 Find the y-intercept. Substitute the slope and the coordinates of the given point into $y = mx + b$. Solve for b .

$$y = mx + b$$

$$\underline{\quad} = \underline{\quad}(\underline{\quad}) + b$$

$$\underline{\quad} = b$$

Write slope-intercept form.

Substitute _____ for m , _____ for x , and _____ for y .

Solve for _____.

Step 3 Write an equation of the line.

$$y = mx + b$$

$$y = \underline{\quad}$$

Write slope-intercept form.

Substitute _____ for m and _____ for b .

Be careful not to mix up the x - and y -values when you substitute.

Your Notes

✓ Checkpoint Complete the following exercise.

1. Write an equation of the line that passes through the point $(2, 2)$ and has a slope of 4.

Example 2 Write an equation given two points

Write an equation of the line that passes through $(2, -3)$ and $(-2, 1)$.

Solution

Step 1 Calculate the slope.

$$\begin{aligned} m &= \frac{y_2 - y_1}{x_2 - x_1} \\ &= \frac{\boxed{} - \boxed{}}{\boxed{} - \boxed{}} \\ &= \frac{\boxed{}}{\boxed{}} = \underline{\hspace{2cm}} \end{aligned}$$

You can also find the y -intercept using the coordinates of the other given point.

Step 2 Find the y -intercept. Use the slope and the point $(2, -3)$.

$$y = mx + b$$

$$-3 = \underline{\hspace{1cm}}(\underline{\hspace{1cm}}) + b$$

$$\underline{\hspace{1cm}} = b$$

Write slope-intercept form.

Substitute $\underline{\hspace{1cm}}$ for m , $\underline{\hspace{1cm}}$ for x , and $\underline{\hspace{1cm}}$ for y .

Solve for b .

Step 3 Write an equation of the line.

$$y = mx + b$$

$$y = \underline{\hspace{2cm}}$$

Write slope-intercept form.

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

Your Notes

✔ **Checkpoint** Complete the following exercise.

2. Write an equation for the line that passes through $(-8, -13)$ and $(4, 2)$.

3. Write an equation for the line that passes through $(-3, 4)$ and $(1, -2)$.

HOW TO WRITE EQUATIONS IN SLOPE-INTERCEPT FORM

1. Given slope m and y -intercept b .

Substitute ____ and ____ in the equation
_____.

2. Given slope m and one point.

Substitute ____ and the _____ of the
point in _____. Solve for _____. Write
the _____.

3. Given two points.

Use the points to find the slope _____. Then
substitute ____ and the _____ of _____
_____ in _____. Solve for _____. Write
the _____.

Homework