5-3 Slope-Intercept Form

Vocabulary

Review

1. **Multiple Choice** Which equation is NOT a *linear* equation?

(A) $y = -3x + 4$ (B) $y = x$ (C) $y = \frac{x}{5} - 7$ (D) $y = 5^x$

2. Place a ✓ in the box if the statement applies to the graph of a *linear* equation. Place an ✗ if it does NOT apply to the graph of a *linear* equation.

☐ The graph of a linear equation is always a horizontal line.

☐ The graph of a linear equation is always a straight line.

☐ The graph of a linear equation may be shaped like a "U."

Vocabulary Builder

intercept (noun) IN **tur sept**

Other Word Forms: intercepted (verb), interception (noun)

Definition: An **intercept** is a point where someone or something is stopped along its way from one place to another.

Main Idea: You can find the **intercept(s)** of a graph by finding the point(s) where the graph crosses a coordinate axis.

Related Words: *x*-intercept; *y*-intercept

A ***y*-intercept** is the *y*-coordinate of a point where a graph crosses the *y*-axis.

Use Your Vocabulary

Choose the correct word from the list to complete each sentence.

intercept intercepted interception

3. During a football game, the home team's quarterback threw an ? . _____

4. The *y*-coordinate of a point where a graph crosses the *y*-axis is a *y*- ? . _____

5. The teacher ? the message Charlie was passing to his friend. _____

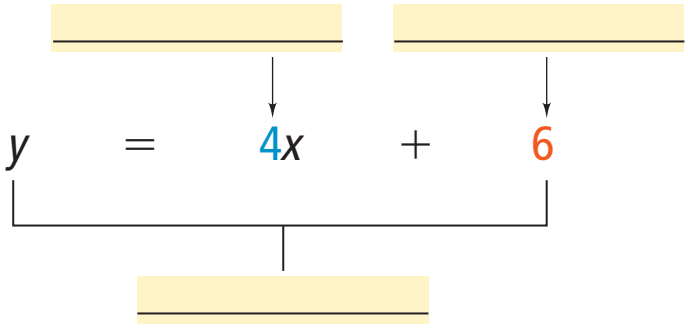
take note

Key Concept Slope-Intercept Form of a Linear Equation

The **slope-intercept** form of a linear equation of a nonvertical line is $y = mx + b$.

The slope of the line is m. The y-intercept is b.

6. Use the words *slope, y-intercept,* and *slope-intercept form* to complete the diagram at the right.



Problem 2 Writing an Equation in Slope-Intercept Form

Got It? **What is an equation of the line with slope $\frac{3}{2}$ and y-intercept -1?**

7. Write the numbers $\frac{3}{2}$ and -1 in the correct boxes below.

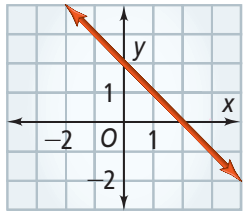
$y = m \cdot x + b$

$y = \square \cdot x + \square$

8. An equation in slope-intercept form is ____.

Problem 3 Writing an Equation From a Graph

Got It? **What is an equation of the line shown at the right?**



9. Find two points on the graph to find the slope of the line. What two points will you use?

(____ , ____) and (____ , ____)

10. Use the points to find the slope of the line.

11. The slope of the line is ____.

12. Use the graph to find the y-intercept.

The y-intercept is ____.

13. Write the slope-intercept form of the equation.

Problem 4 Writing an Equation From Two Points

Got It? **What equation in slope-intercept form represents the line that passes through the points $(3, -2)$ and $(1, -3)$?**

14. Circle the first step to solve this problem. Underline the second step.

Solve for b. Find the slope. Write the slope-intercept form.

15. Use the points $(3, -2)$ and $(1, -3)$ to find the slope of the line.

$$m = \frac{\square - (-3)}{3 - \square} = \frac{1}{\square}$$

16. Next, find the y-intercept. Substitute the slope for m and the coordinates of one of the points for x and y. Then solve for b.

$$y = m \cdot x + b$$

17. Write the equation of the line in slope-intercept form. Substitute the slope for m and the y-intercept for b.

$y = \square \cdot x + \square$

Problem 5 Graphing a Linear Equation

Got It? **What is the graph of $y = -3x + 4$?**

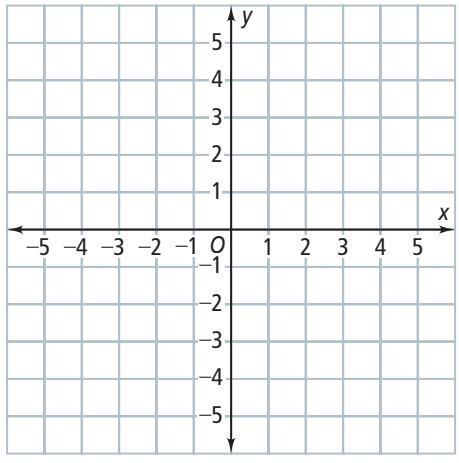
18. The ordered pair for the y-intercept, 4, is (,).

19. Explain how you will use the slope to find another point on the line.

_____

20. Use the slope, -3, to find another point on the line.

21. Use the points you found in Exercises 18 and 20. What is the graph of $y = -3x + 4$?



Problem 6 Modeling a Function

Got It? **A plumber charges a \$65 fee for a repair plus \$35 per hour. Write an equation to model the total cost y of a repair that takes x hours. What graph models the total cost?**

22. Let $x =$ the number of hours the plumber works. Let $y =$ the total cost of a repair.

When $x = 0$, $y =$ ____. So the y-intercept is ____.

23. The slope is the amount of change each hour.

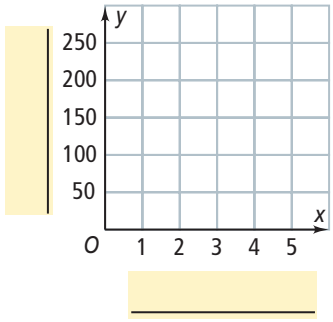
So, the slope is ____.

24. Write an equation to model the cost of a repair.

25. Complete the table for your equation.

Hours (x)	0	1			
Total Cost (y)	65				

26. Graph the data from the table to model the total cost. Be sure to label the axes.



Lesson Check • Do you UNDERSTAND?

Vocabulary **Is $y = 5$ a linear equation? Explain.**

27. Does $y = 5$ have a slope? Explain.

28. Find three points that satisfy $y = 5$.

(,) (,) (,)

29. Is $y = 5$ a linear equation? Explain.

Math Success

Check off the vocabulary words that you understand.

☐ linear function ☐ y-intercept ☐ slope-intercept form

Rate how well you can *find the slope-intercept form of a linear equation.*

Need to review 0 2 4 6 8 10 Now I get it!