Personal Math Trainer
Online Practice and Help
my.hrw.com

YOUR TURN

5. Hari's weekly allowance varies depending on the number of chores he does. He received $16 in allowance the week he did 12 chores, and $14 in allowance the week he did 8 chores. Write an equation for his allowance in slope-intercept form. $y = 0.5x + 10$

Guided Practice

1. Li is making beaded necklaces. For each necklace, she uses 27 spacer beads, plus 5 glass beads per inch of necklace length. Write an equation to find how many beads Li needs for each necklace. (Explore Activity)

a. independent variable: the length of the necklace in inches

b. dependent variable: the total number of beads in the necklace

c. equation: $y = 5x + 27$

2. Kate is planning a trip to the beach. She estimates her average speed to graph her expected progress on the trip. Write an equation in slope-intercept form that represents the situation. (Example 1)

Choose two points on the graph to find the slope.

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{0 - 300}{5 - 0} = \frac{-300}{5} = -60$

Read the y-intercept from the graph: $b =$ 300

Use your slope and y-intercept values to write an equation in slope-intercept form. $y = -60x + 300$

3. At 59°F, crickets chirp at a rate of 76 times per minute, and at 65°F, they chirp 100 times per minute. Write an equation in slope-intercept form that represents the situation. (Example 2)

Independent variable: temperature Dependent variable: chirps per minute

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{100 - 76}{65 - 59} = \frac{24}{6} = 4$ Use the slope and one of the ordered pairs in $y = mx + b$ to find b. $100 = 4 \cdot 65 + b$; $-160 = b$

Write an equation in slope-intercept form. $y = 4x - 160$

ESSENTIAL QUESTION CHECK-IN

4. Explain what m and b in the equation $y = mx + b$ tell you about the graph of the line with that equation.

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

Name _____ Class _____ Date _____

5.1 Independent Practice

CA CCSS 8.F.4

Personal Math Trainer
Online Practice and Help
my.hrw.com

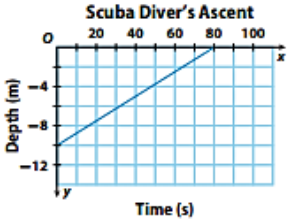
5. A dragonfly can beat its wings 30 times per second. Write an equation in slope-intercept form that shows the relationship between flying time in seconds and the number of times the dragonfly beats its wings.

$y = 30x$

6. A balloon is released from the top of a platform that is 50 meters tall. The balloon rises at the rate of 4 meters per second. Write an equation in slope-intercept form that tells the height of the balloon above the ground after a given number of seconds.

$y = 4x + 50$

The graph shows a scuba diver's ascent over time.



7. Use the graph to find the slope of the line. Tell what the slope means in this context.

$m = 0.125$; the diver ascends at a rate of 0.125 m/s

8. Identify the *y*-intercept. Tell what the *y*-intercept means in this context.

−10; the diver starts 10 meters below the water's surface.

9. Write an equation in slope-intercept form that represents the diver's depth over time.

$y = 0.125x - 10$

10. The formula for converting Celsius temperatures to Fahrenheit temperatures is a linear equation. Water freezes at 0°C, or 32°F, and it boils at 100°C, or 212°F. Find the slope and *y*-intercept for a graph that gives degrees Celsius on the horizontal axis and degrees Fahrenheit on the vertical axis. Then write an equation in slope-intercept form that converts degrees Celsius into degrees Fahrenheit.

$m = \frac{9}{5}$; $b = 32$; $y = \frac{9}{5}x + 32$ where $y =$ °F and $x =$ °C

11. The cost of renting a sailboat at a lake is $20 per hour plus $12 for lifejackets. Write an equation in slope-intercept form that can be used to calculate the total amount you would pay for using this sailboat.

$y = 20x + 12$

The graph shows the activity in a savings account.

12. What was the amount of the initial deposit that started this savings account?

$1000

13. Find the slope and *y*-intercept of the graphed line.

$m = 500$; $b = 1000$

14. Write an equation in slope-intercept form for the activity in this savings account.

$y = 500x + 1000$

15. Explain the meaning of the slope in this graph.

The amount of money in the savings account increases by $500 each month.

H.O.T. FOCUS ON HIGHER ORDER THINKING

16. **Communicate Mathematical Ideas** Explain how you decide which part of a problem will be represented by the variable *x*, and which part will be represented by the variable *y* in a graph of the situation.

Examine the problem and decide what is the thing you start with and what is the thing you are trying to find. Use what you start with for *x* and what you are trying to find for *y*.

17. **Represent Real-World Problems** Describe what would be true about the rate of change in a situation that could *not* be represented by a graphed line and an equation in the form $y = mx + b$.

The rate of change would not be constant. Using different pairs of points in the slope formula would give you different results.

18. **Draw Conclusions** Must *m*, in the equation $y = mx + b$, always be a positive number? Explain.

No. A negative number for *m* means the dependent variable is decreasing as the independent variable increases, so the graph falls from left to right.

Work Area