

4.2 Exercises

Vocabulary and Core Concept Check

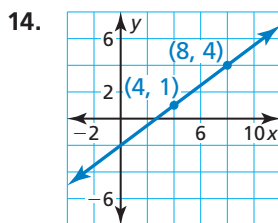
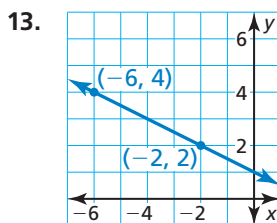
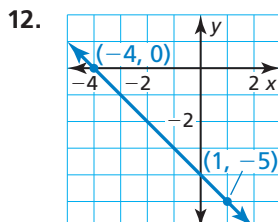
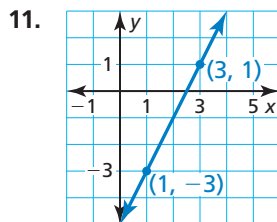
- USING STRUCTURE** Without simplifying, identify the slope of the line given by the equation $y - 5 = -2(x + 5)$. Then identify one point on the line.
- WRITING** Explain how you can use the slope formula to write an equation of the line that passes through $(3, -2)$ and has a slope of 4.

Monitoring Progress and Modeling with Mathematics

In Exercises 3–10, write an equation in point-slope form of the line that passes through the given point and has the given slope. (See Example 1.)

- $(2, 1); m = 2$
- $(3, 5); m = -1$
- $(7, -4); m = -6$
- $(-8, -2); m = 5$
- $(9, 0); m = -3$
- $(0, 2); m = 4$
- $(-6, 6); m = \frac{3}{2}$
- $(5, -12); m = -\frac{2}{5}$

In Exercises 11–14, write an equation in slope-intercept form of the line shown. (See Example 2.)



In Exercises 15–20, write an equation in slope-intercept form of the line that passes through the given points.

- $(7, 2), (2, 12)$
- $(6, -2), (12, 1)$
- $(6, -1), (3, -7)$
- $(-2, 5), (-4, -5)$
- $(1, -9), (-3, -9)$
- $(-5, 19), (5, 13)$

In Exercises 21–26, write a linear function f with the given values. (See Example 3.)

- $f(2) = -2, f(1) = 1$
- $f(5) = 7, f(-2) = 0$
- $f(-4) = 2, f(6) = -3$
- $f(-10) = 4, f(-2) = 4$
- $f(-3) = 1, f(13) = 5$
- $f(-9) = 10, f(-1) = -2$

In Exercises 27–30, tell whether the data in the table can be modeled by a linear equation. Explain. If possible, write a linear equation that represents y as a function of x . (See Example 4.)

27.

x	2	4	6	8	10
y	-1	5	15	29	47

28.

x	-3	-1	1	3	5
y	16	10	4	-2	-8

29.

x	y
0	1.2
1	1.4
2	1.6
4	2

30.

x	y
1	18
2	15
4	12
8	9

31. **ERROR ANALYSIS** Describe and correct the error in writing a linear function g with the values $g(5) = 4$ and $g(3) = 10$.

X

$$m = \frac{10 - 4}{3 - 5} = \frac{6}{-2} = -3$$

$$y - y_1 = mx - x_1$$

$$y - 4 = -3x - 5$$

$$y = -3x - 1$$

A function is $g(x) = -3x - 1$.

32. **ERROR ANALYSIS** Describe and correct the error in writing an equation of the line that passes through the points (1, 2) and (4, 3).



$$m = \frac{3 - 2}{4 - 1} = \frac{1}{3} \quad y - 2 = \frac{1}{3}(x - 4)$$

33. **MODELING WITH MATHEMATICS** You are designing a sticker to advertise your band. A company charges \$225 for the first 1000 stickers and \$80 for each additional 1000 stickers.

- Write an equation that represents the total cost (in dollars) of the stickers as a function of the number (in thousands) of stickers ordered.
- Find the total cost of 9000 stickers.

34. **MODELING WITH MATHEMATICS** You pay a processing fee and a daily fee to rent a beach house. The table shows the total cost of renting the beach house for different numbers of days.

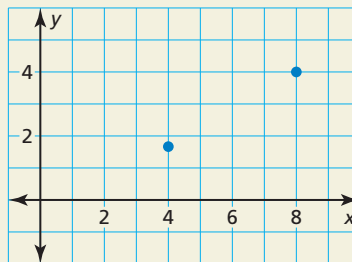
Days	2	4	6	8
Total cost (dollars)	246	450	654	858

- Can the situation be modeled by a linear equation? Explain.
 - What is the processing fee? the daily fee?
 - You can spend no more than \$1200 on the beach house rental. What is the maximum number of days you can rent the beach house?
35. **WRITING** Describe two ways to graph the equation $y - 1 = \frac{3}{2}(x - 4)$.

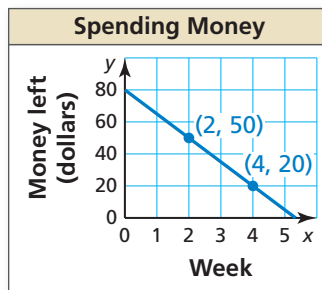
36. **THOUGHT PROVOKING** The graph of a linear function passes through the point (12, -5) and has a slope of $\frac{2}{5}$. Represent this function in two other ways.

37. **REASONING** You are writing an equation of the line that passes through two points that are not on the y-axis. Would you use slope-intercept form or point-slope form to write the equation? Explain.

38. **HOW DO YOU SEE IT?** The graph shows two points that lie on the graph of a linear function.



- Does the y-intercept of the graph of the linear function appear to be positive or negative? Explain.
 - Estimate the coordinates of the two points. How can you use your estimates to confirm your answer in part (a)?
39. **CONNECTION TO TRANSFORMATIONS** Compare the graph of $y = 2x$ to the graph of $y - 1 = 2(x + 3)$. Make a conjecture about the graphs of $y = mx$ and $y - k = m(x - h)$.
40. **COMPARING FUNCTIONS** Three siblings each receive money for a holiday and then spend it at a constant weekly rate. The graph describes Sibling A's spending, the table describes Sibling B's spending, and the equation $y = -22.5x + 90$ describes Sibling C's spending. The variable y represents the amount of money left after x weeks.



Week, x	Money left, y
1	\$100
2	\$75
3	\$50
4	\$25

- Which sibling received the most money? the least money?
- Which sibling spends money at the fastest rate? the slowest rate?
- Which sibling runs out of money first? last?

Maintaining Mathematical Proficiency Reviewing what you learned in previous grades and lessons

Write the reciprocal of the number. (*Skills Review Handbook*)

41. 5

42. -8

43. $-\frac{2}{7}$

44. $\frac{3}{2}$