GUIDED PRACTICE

Vocabulary Check ✓   **1.** What does *intercept* mean in the expression *slope-intercept form*?

Concept Check ✓   **2.** The slope of line j is 2 and $j \parallel k$. What is the slope of line k?

3. What is the slope of a horizontal line? What is the slope of a vertical line?

Skill Check ✓   **Find the slope of the line that passes through the labeled points.**

4.

(3, 4)

1

(0, 0)

1

5.

(2, 5)

(4, 1)

-1

1

6.

(0, 4)

2 x

-2

(-8, -6)
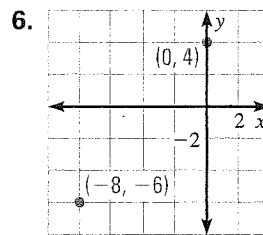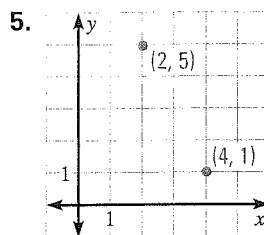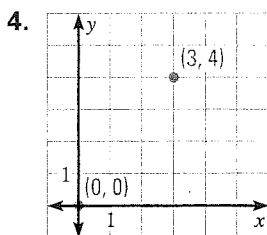
Determine whether the two lines shown in the graph are parallel. If they are parallel, explain how you know.

7.

B

A

C

D

-1

1

8.

E

-2
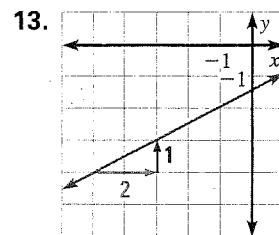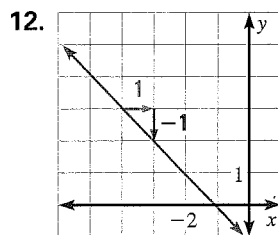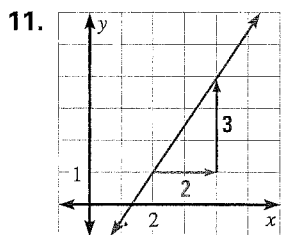
G

F

1

H

9.

J   K

1

M   x

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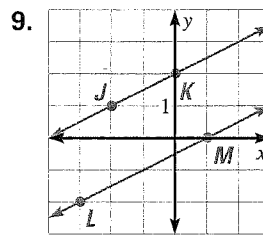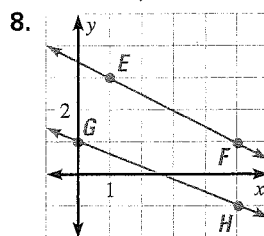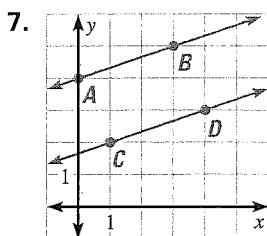
10. Write an equation of the line that passes through the point $(2, -3)$ and has a slope of -1.

PRACTICE AND APPLICATIONS

CALCULATING SLOPE What is the slope of the line?

11.

1

3

2

2

12.

1

-1

1

-2

13.

-1 x
-1

1

2

CALCULATING SLOPE Find the slope of the line that passes through the labeled points on the graph.
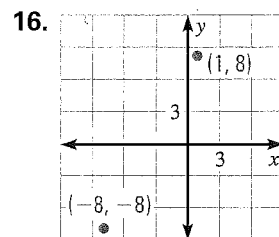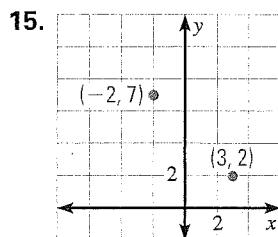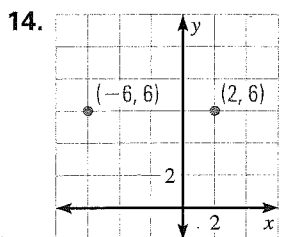
14.

(-6, 6)   (2, 6)

2

2

15.

(-2, 7)

(3, 2)

-2

2

16.

(1, 8)

3

3 x

(-8, -8)

STUDENT HELP

↳ HOMEWORK HELP
Example 3: Exs. 17–22
Example 4: Exs. 24–26,
              47, 48
Example 5: Exs. 27–41
Example 6: Exs. 42–45

IDENTIFYING PARALLELS Find the slope of each line. Are the lines parallel?

17.

18.

19.

.20.

21.

22.
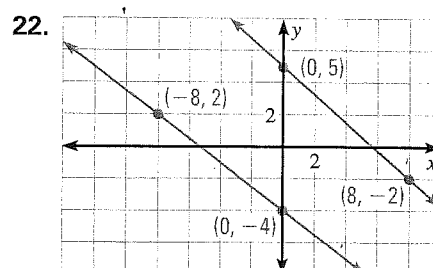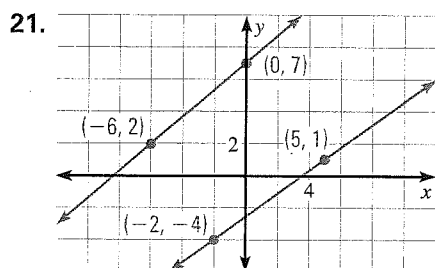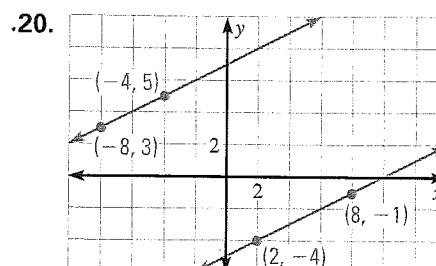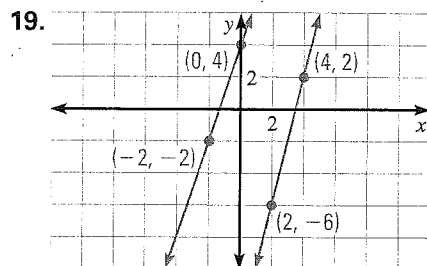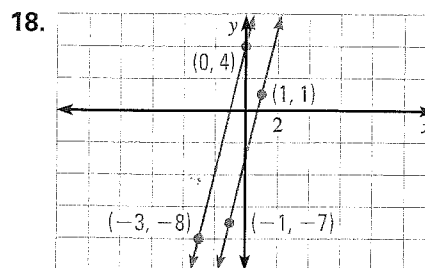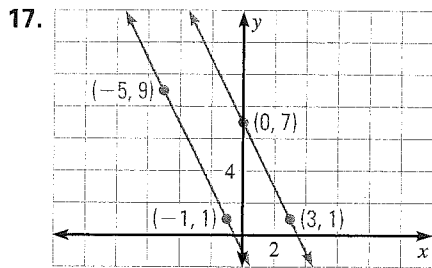
23. 🐦 **UNDERGROUND RAILROAD** The photo at the right shows a monument in Oberlin, Ohio, that is dedicated to the Underground Railroad. The slope of each of the rails is about $-\frac{3}{5}$ and the sculpture is about 12 feet long. What is the height of the ends of the rails? Explain how you found your answer.

IDENTIFYING PARALLELS Find the slopes of $\overleftrightarrow{AB}$, $\overleftrightarrow{CD}$, and $\overleftrightarrow{EF}$. Which lines are parallel, if any?
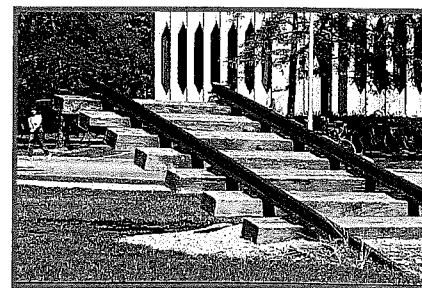
24. $A(0, -6)$, $B(4, -4)$
$C(0, 2)$, $D(2, 3)$
$E(0, -4)$, $F(1, -7)$

25. $A(2, 6)$, $B(4, 7)$
$C(0, -1)$, $D(6, 2)$
$E(4, -5)$, $F(8, -2)$

26. $A(-4, 10)$, $B(-8, 7)$
$C(-5, 7)$, $D(-2, 4)$
$E(2, -3)$, $F(6, -7)$

WRITING EQUATIONS Write an equation of the line.

27. slope $= 3$
y-intercept $= 2$

28. slope $= \frac{1}{3}$
y-intercept $= -4$

29. slope $= -\frac{2}{9}$
y-intercept $= 0$

30. slope $= \frac{1}{2}$
y-intercept $= 6$

31. slope $= 0$
y-intercept $= -3$

32. slope $= -\frac{2}{9}$
y-intercept $= -\frac{3}{5}$
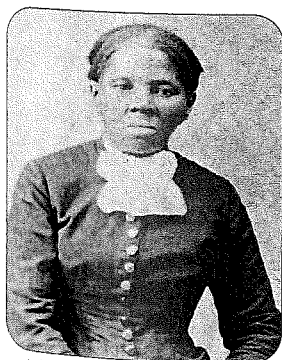
REAL LIFE **UNDERGROUND RAILROAD** is the name given to the network of people who helped some slaves to freedom. Harriet Tubman, a former slave, helped about 300 escape.

WRITING EQUATIONS Write an equation of the line that has a *y*-intercept of 3 and is parallel to the line whose equation is given.

33. $y = -6x + 2$ **34.** $y = x - 8$ **35.** $y = -\frac{4}{3}x$

WRITING EQUATIONS Write an equation of the line that passes through the given point *P* and has the given slope.

36. $P(0, -6), m = -2$ **37.** $P(-3, 9), m = -1$ **38.** $P\left(\frac{3}{2}, 4\right), m = \frac{1}{2}$

39. $P(2, -4), m = 0$ **40.** $P(-7, -5), m = \frac{3}{4}$ **41.** $P(6, 1)$, undefined slope

🌐 **USING ALGEBRA** Write an equation of the line that passes through point *P* and is parallel to the line with the given equation.
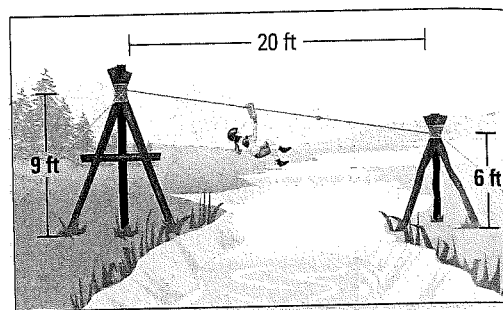
42. $P(-3, 6), y = -x - 5$ **43.** $P(1, -2), y = \frac{5}{4}x - 8$ **44.** $P(8, 7), y = 3$

45. 🌐 **USING ALGEBRA** Write an equation of a line parallel to $y = \frac{1}{3}x - 16$.

46. 🧗 **ZIP LINE** A zip line is a taut rope or cable that you can ride down on a pulley. The zip line at the right goes from a 9 foot tall tower to a 6 foot tall tower. The towers are 20 feet apart. What is the slope of the zip line?

COORDINATE GEOMETRY In Exercises 47 and 48, use the five points: *P*(0, 0), *Q*(1, 3), *R*(4, 0), *S*(8, 2), and *T*(9, 5).

47. Plot and label the points. Connect every pair of points with a segment.

48. Which segments are parallel? How can you verify this?

🏗 **CIVIL ENGINEERING** In Exercises 49–52, use the following information. The slope of a road is called the road's *grade*. Grades are measured in percents. For example, if the slope of a road is $\frac{1}{20}$, the grade is 5%. A warning sign is needed before any hill that fits one of the following descriptions.

    5% grade and more than 3000 feet long
    6% grade and more than 2000 feet long
    7% grade and more than 1000 feet long
    8% grade and more than 750 feet long
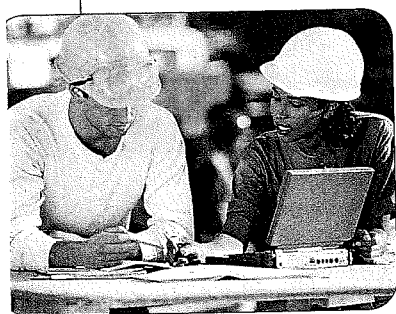   9% grade and more than 500 feet long

▶ Source: U.S. Department of Transportation

What is the grade of the hill to the nearest percent? Is a sign needed?

49. The hill is 1400 feet long and drops 70 feet.

50. The hill is 2200 feet long and drops 140 feet.

51. The hill is 600 feet long and drops 55 feet.

52. The hill is 450 feet long and drops 40 feet.