2.3 Assess Your Understanding

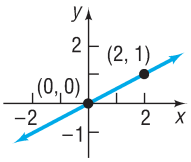
Concepts and Vocabulary

1. The slope of a vertical line is _____; the slope of a horizontal line is _____.
2. For the line $2x + 3y = 6$, the x-intercept is _____ and the y-intercept is _____.
3. A horizontal line is given by an equation of the form _____, where b is the _____.
4. ***True or False*** Vertical lines have an undefined slope.
5. ***True or False*** The slope of the line $2y = 3x + 5$ is 3.
6. ***True or False*** The point $(1, 2)$ is on the line $2x + y = 4$.
7. Two nonvertical lines have slopes m_1 and m_2, respectively. The lines are parallel if _____ and the _____ are unequal; the lines are perpendicular if _____.
8. The lines $y = 2x + 3$ and $y = ax + 5$ are parallel if $a =$ _____.
9. The lines $y = 2x - 1$ and $y = ax + 2$ are perpendicular if $a =$ _____.
10. ***True or False*** Perpendicular lines have slopes that are reciprocals of one another.

Skill Building

In Problems 11–14, (a) find the slope of the line and (b) interpret the slope.

11.



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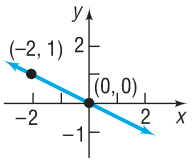

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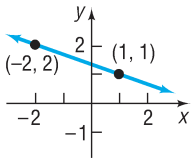

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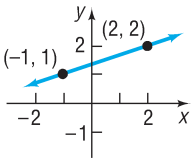


In Problems 15–22, plot each pair of points and determine the slope of the line containing them. Graph the line.

15. $(2, 3); (4, 0)$ **16.** $(4, 2); (3, 4)$ **17.** $(-2, 3); (2, 1)$ **18.** $(-1, 1); (2, 3)$

19. $(-3, -1); (2, -1)$ **20.** $(4, 2); (-5, 2)$ **21.** $(-1, 2); (-1, -2)$ **22.** $(2, 0); (2, 2)$

In Problems 23–30, graph the line containing the point P and having slope m.

23. $P = (1, 2); m = 3$ **24.** $P = (2, 1); m = 4$ **25.** $P = (2, 4); m = -\frac{3}{4}$ **26.** $P = (1, 3); m = -\frac{2}{5}$

27. $P = (-1, 3); m = 0$ **28.** $P = (2, -4); m = 0$ **29.** $P = (0, 3)$; slope undefined **30.** $P = (-2, 0)$; slope undefined

In Problems 31–36, the slope and a point on a line are given. Use this information to locate three additional points on the line. Answers may vary.

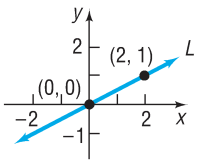
[**Hint:** *It is not necessary to find the equation of the line. See Example 3.*]

31. Slope 4; point $(1, 2)$ **32.** Slope 2; point $(-2, 3)$ **33.** Slope $-\frac{3}{2}$; point $(2, -4)$

34. Slope $\frac{4}{3}$; point $(-3, 2)$ **35.** Slope -2; point $(-2, -3)$ **36.** Slope -1; point $(4, 1)$

In Problems 37–44, find an equation of the line L.

37.



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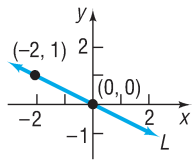

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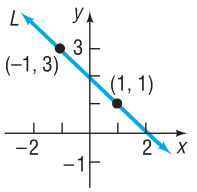

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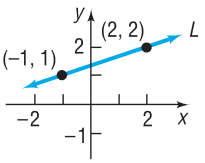

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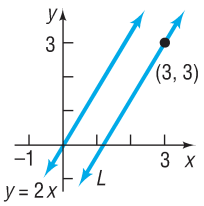
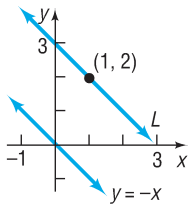


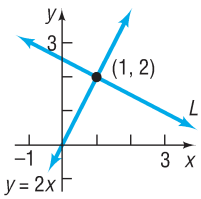
L is parallel to $y = 2x$

42.



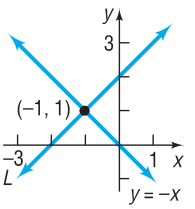
L is parallel to $y = -x$

43.



L is perpendicular to $y = 2x$

44.



L is perpendicular to $y = -x$