The Slope-Intercept Equation of a Line

In Exercises 5–10, solve for *y*.

5. $5x + 7y = 0$ **6.** $2x - 4y = 0$ **7.** $3x + 4y = 12$

8. $-4x + 5y = 8$ **9.** $y + 10 = 0$ **10.** $y - 12 = 0$

In Exercises 11–16, find the slope and the *y*-intercept of the line.

11. $y = -2x + 1$ **12.** $y = 3x - 6$ **13.** $y = -4 + (-8x)$

14. $y = 4x - 20$ **15.** $x - y = 3x + 4$ **16.** $2y - x = 7x - 9$

In Exercises 17–28, write in slope-intercept form. Then sketch the line.

17. $2x - y - 3 = 0$ **18.** $x - y + 2 = 0$ **19.** $x + y = 0$

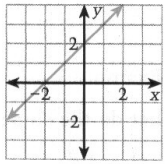
20. $x - y = 0$ **21.** $x + 2y - 2 = 0$ **22.** $3x - 2y - 2 = 0$

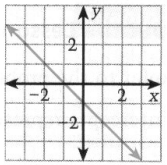
23. $3x - 4y + 2 = 0$ **24.** $10x + 6y - 3 = 0$ **25.** $y - 3 = 0$

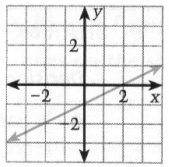
26. $y + 5 = 0$ **27.** $2x + 3y - 4 = x + 5$ **28.** $-x + 4y + 3 = 2x - 7$

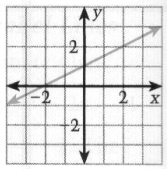
In Exercises 29–32, match the equation with its graph.

29. $y = \frac{1}{2}x + 1$ **30.** $y = \frac{1}{2}x - 1$ **31.** $y = x + 2$ **32.** $y = -x - 1$

a. 

b. 

c. 

d. 

In Exercises 33–36, sketch the two lines on the same coordinate plane. Find the slope and *x*- and *y*-intercepts of the lines.

33. $y = -3x + 2,\ y = -3x - 2$ **34.** $y = -x + 6,\ y = -x + 10$

In Exercises 35–38, sketch the line that passes through the given points. Use the graph to estimate the *y*-intercept of the line. Then find the actual *y*-intercept. See margin.

35. $(3, -3), (-6, 0)$ -2 **36.** $(1, 1), (-3, -1)$ $\frac{1}{2}$ **37.** $(1, 1), (-5, -3)$ $\frac{1}{3}$ **38.** $(1, 2), (-4, 7$

Answers

5. $y=-\frac{5}{7}x$

6. $y=\frac{1}{2}x$

7. $y=-\frac{3}{4}x+3$

8. $y=\frac{4}{5}x+\frac{8}{5}$

9. $y=-10$

10. $y=12$

11. $-2,\ 1$

12. $3,-6$

13. $-8,-4$

14. $4,-20$

15. $-2,-4$

16. $4,-\frac{9}{2}$

17. $y=2x-3$

18. $y=x+2$

19. $y=-x$

20. $y=x$

21. $y=-\frac{x}{2}+1$

22. $y=\frac{3}{2}x-1$

23. $y=\frac{3}{4}x+\frac{1}{2}$

24. $y=-\frac{5}{3}x+\frac{1}{2}$

25. $y=3$

26. $y=-6$

27. $y=-\frac{x}{3}+3$

28. $y=\frac{3}{4}x-\frac{5}{2}$

29. d

30. c

31. a

32. b

33. $-3;\ (\frac{2}{3},0),(0,2),(-\frac{2}{3},0),(0,-2)$

34. $-1;\ (6,0),(0,6),(10,0),(0,10)$

Exercises 9–20, write an equation of the line that passes through the nt and has the given slope. Write the equation in slope-intercept form.

9. $(-3, 6),\ m = 2$ **10.** $(3, 2),\ m = 1$ **11.** $(4, -2),\ m = -1$ **12.** $(3, 1),\ m = -3$

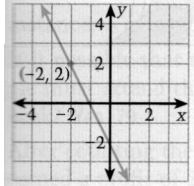
13. $(-2, -5),\ m = -2$ **14.** $(1, 4),\ m = 4$ **15.** $(4, -2),\ m = \frac{1}{2}$ **16.** $(-6, 5),\ m = \frac{1}{3}$

17. $(0, -1),\ m = 3$ **18.** $(0, 4),\ m = 2$ **19.** $(2, 5),\ m = 0$ **20.** $(1, -3),\ m = 0$

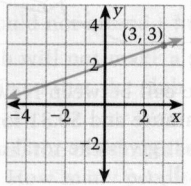
Exercises 21–26, write the slope-intercept form of the equation of the line.

21. The line has a slope of $\frac{2}{3}$ and passes through the point $(-3, 4)$. $y = \frac{2}{3}x + 6$

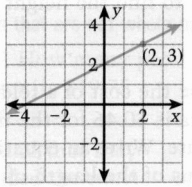
22. The line has a slope of $-\frac{1}{4}$ and passes through the point $(8, 3)$. $y = -\frac{1}{4}x + 5$

23. 

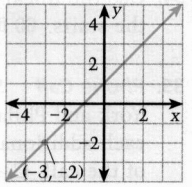
$y = -2x - 2$

24. 

$y = \frac{1}{3}x + 2$

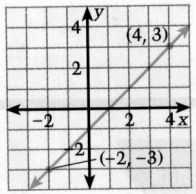
25. 

$y = \frac{1}{2}x + 2$

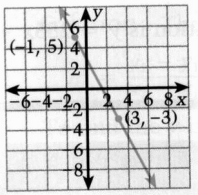
26. 

$y = x + 1$

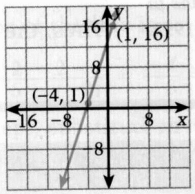
In Exercises 7–10, write the slope-intercept form of the equation of the line.

7. 

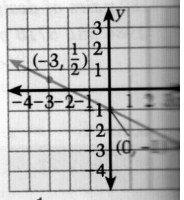
$y = x - 1$

8. 

$y = -2x + 3$

9. 

$y = 3x + 13$

10. 

$y = -\frac{1}{2}x - 1$

In Exercises 11–22, write the slope-intercept form of the equation of the line that passes through the two points. See below.

11. $(-1, -1), (2, 8)$ **12.** $(1, 2), (4, -1)$ **13.** $(2, 0), (-4, -3)$ **14.** $(3, 1), (-3, 5)$

15. $(1, -4), (-2, 8)$ **16.** $(0, -4), (3, 2)$ **17.** $(2, -5), (-1, 1)$ **18.** $(-2, -1), (4, 2)$

19. $(1, 1), (4, 4)$ $y = x$ **20.** $(1, 2), (2, 4)$ $y = 2x$ **21.** $(1, 3), (3, 3)$ $y = 3$ **22.** $(-1, -2), (3, -2)$

23. Sketch the line that passes through $(2, 6)$ and $(-4, 3)$. Write its equation in slope-intercept form. $y = \frac{1}{2}x + 5$. See margin.

24. Sketch the line that passes through $(3, -3)$ and $(-3, 1)$. Write its equation in slope-intercept form. $y = -\frac{2}{3}x - 1$.

25. Write an equation of the line whose x-intercept is -6 and whose y-intercept is -4. $y = -\frac{2}{3}x - 4$

26. Write an equation of the line whose x-intercept is -1 and whose y-intercept is 3. $y = 3x + 3$

11. $y = 3x + 2$ 12. $y = -x + 3$ 15. $y = -4x$ 16. $y = 2x - 4$ 17. $y = -2x - 1$

In Exercises 43–46, determine whether the given three points lie on the same line. If they do, find an equation of the line.

43. $(-3, -1), (0, 1), (12, 9)$ They do, $y = \frac{2}{3}x + 1$ ✪ **44.** $(4, -2), (-1, 2), (-8, 9)$ They do not.

45. $(-2, -1), (3, 2), (7, 5)$ They do not. ✪ **46.** $(3, -3), (-1, 13), (1, 5)$ They do, $y =$