

8.2 EXERCISE SET

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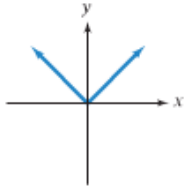
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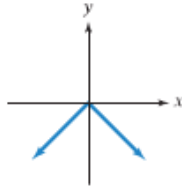
Practice Exercises

In Exercises 1–8, use the vertical line test to identify graphs in which y is a function of x .

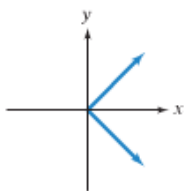
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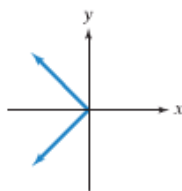
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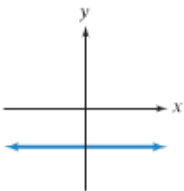
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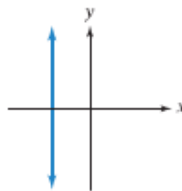
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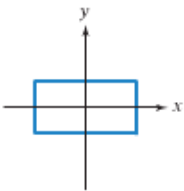
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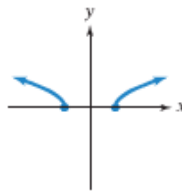
6.



7.



8.



In Exercises 9–14, use the graph of f to find each indicated function value.

9. $f(-2)$

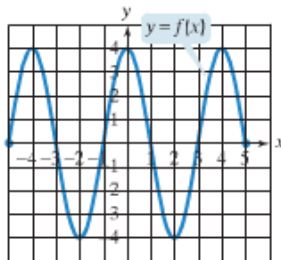
10. $f(2)$

11. $f(4)$

12. $f(-4)$

13. $f(-3)$

14. $f(-1)$



Use the graph of g to solve Exercises 15–20.

15. Find $g(-4)$.

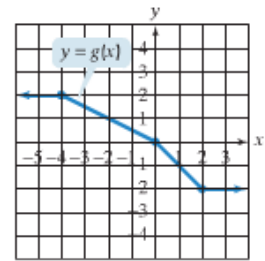
16. Find $g(2)$.

17. Find $g(-10)$.

18. Find $g(10)$.

19. For what value of x is $g(x) = 1$?

20. For what value of x is $g(x) = -1$?



In Exercises 21–34, express each interval in set-builder notation and graph the interval on a number line.

21. $(1, 6)$

22. $(-2, 4]$

23. $[-5, 2)$

24. $[-4, 3)$

25. $[-3, 1]$

26. $[-2, 5]$

27. $(2, \infty)$

28. $(3, \infty)$

29. $[-3, \infty)$

30. $[-5, \infty)$

31. $(-\infty, 3)$

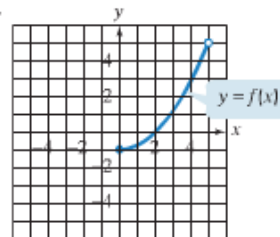
32. $(-\infty, 2)$

33. $(-\infty, 5.5)$

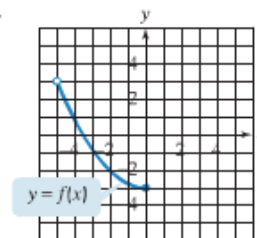
34. $(-\infty, 3.5]$

In Exercises 35–44, use the graph of each function to identify its domain and its range.

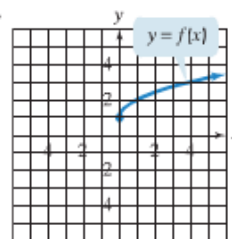
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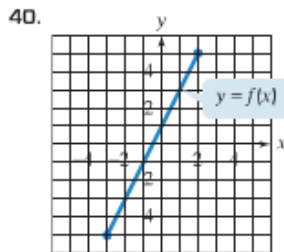
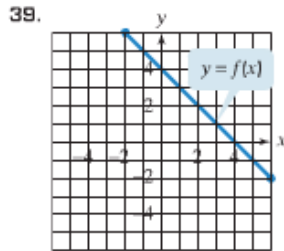
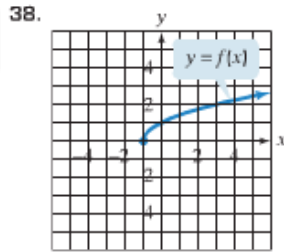


36.

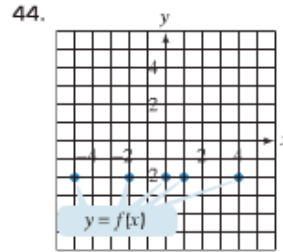
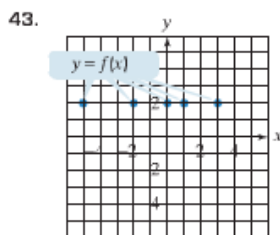
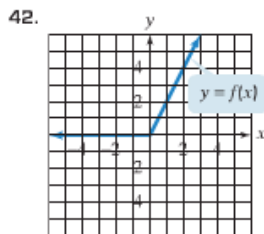
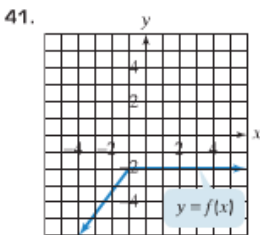


37.



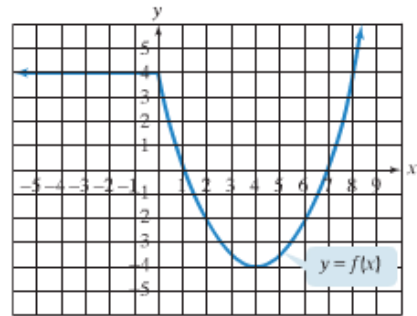


41. _____



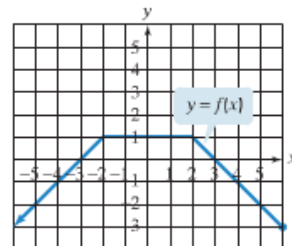
Practice PLUS

45. Use the graph of f to determine each of the following.



- the domain of f
- the range of f
- $f(-3)$
- the values of x for which $f(x) = -2$
- the points where the graph of f crosses the x -axis
- the points where the graph of f crosses the y -axis
- values of x for which $f(x) < 0$
- Is $f(-8)$ positive or negative?

46. Use the graph of f to determine each of the following.



- the domain of f
- the range of f
- $f(-4)$
- the values of x for which $f(x) = -3$
- the points where the graph of f crosses the x -axis
- the point where the graph of f crosses the y -axis
- values of x for which $f(x) > 0$
- Is $f(-2)$ positive or negative?

Practice Exercises

In Exercises 1–6, find the intersection of the sets.

- $\{1, 2, 3, 4\} \cap \{2, 4, 5\}$
- $\{1, 3, 7\} \cap \{2, 3, 8\}$
- $\{1, 3, 5, 7\} \cap \{2, 4, 6, 8, 10\}$
- $\{0, 1, 3, 5\} \cap \{-5, -3, -1\}$
- $\{a, b, c, d\} \cap \emptyset$
- $\{w, y, z\} \cap \emptyset$

- $x < 2$ and $x \geq -1$
- $x < 3$ and $x \geq -1$
- $x > 2$ and $x < -1$
- $x > 3$ and $x < -1$
- $5x < -20$ and $3x > -18$
- $3x \leq 15$ and $2x > -6$
- $x - 4 \leq 2$ and $3x + 1 > -8$
- $3x + 2 > -4$ and $2x - 1 < 5$
- $2x > 5x - 15$ and $7x > 2x + 10$
- $6 - 5x > 1 - 3x$ and $4x - 3 > x - 9$
- $4(1 - x) < -6$ and $\frac{x - 7}{5} \leq -2$
- $5(x - 2) > 15$ and $\frac{x - 6}{4} \leq -2$
- $x - 1 \leq 7x - 1$ and $4x - 7 < 3 - x$
- $2x + 1 > 4x - 3$ and $x - 1 \geq 3x + 5$

In Exercises 25–32, solve each inequality and graph the solution set on a number line.

- $6 < x + 3 < 8$
- $7 < x + 5 < 11$

In Exercises 7–24, solve each compound inequality. Use graphs to show the solution set to each of the two given inequalities, as well as a third graph that shows the solution set of the compound inequality.

- $x > 3$ and $x > 6$
- $x > 2$ and $x > 4$
- $x \leq 5$ and $x \leq 1$
- $x \leq 6$ and $x \leq 2$

- $x < 3$ or $x \geq -1$
- $x \geq 2$ or $x < -1$
- $x \geq 3$ or $x < -1$
- $3x > 12$ or $2x < -6$
- $3x < 3$ or $2x > 10$
- $3x + 2 \leq 5$ or $5x - 7 \geq 8$
- $2x - 5 \leq -11$ or $5x + 1 \geq 6$
- $4x + 3 < -1$ or $2x - 3 \geq -11$
- $2x + 1 < 15$ or $3x - 4 \geq -1$
- $-2x + 5 > 7$ or $-3x + 10 > 2x$
- $16 - 3x \geq -8$ or $13 - x > 4x + 3$
- Let $f(x) = 2x + 3$ and $g(x) = 3x - 1$. Find all values of x for which $f(x) \geq 5$ and $g(x) > 11$.
- Let $f(x) = 4x + 5$ and $g(x) = 3x - 4$. Find all values of x for which $f(x) \geq 5$ and $g(x) \leq 2$.
- Let $f(x) = 3x - 1$ and $g(x) = 4 - x$. Find all values of x for which $f(x) < -1$ or $g(x) < -2$.

27. $-3 \leq x - 2 < 1$
 28. $-6 < x - 4 \leq 1$
 29. $-11 < 2x - 1 \leq -5$
 30. $3 \leq 4x - 3 < 19$
 31. $-3 \leq \frac{2x}{3} - 5 < -1$
 32. $-6 \leq \frac{x}{2} - 4 < -3$

In Exercises 33–38, find the union of the sets.

33. $\{1, 2, 3, 4\} \cup \{2, 4, 5\}$
 34. $\{1, 3, 7, 8\} \cup \{2, 3, 8\}$
 35. $\{1, 3, 5, 7\} \cup \{2, 4, 6, 8, 10\}$
 36. $\{0, 1, 3, 5\} \cup \{2, 4, 6\}$
 37. $\{a, e, i, o, u\} \cup \emptyset$
 38. $\{e, m, p, t, y\} \cup \emptyset$

In Exercises 39–54, solve each compound inequality. Use graphs to show the solution set to each of the two given inequalities, as well as a third graph that shows the solution set of the compound inequality.

39. $x > 3$ or $x > 6$
 40. $x > 2$ or $x > 4$
 41. $x \leq 5$ or $x \leq 1$
 42. $x \leq 6$ or $x \leq 2$
 43. $x < 2$ or $x \geq -1$

58. Let $f(x) = 2x - 5$ and $g(x) = 3 - x$. Find all values of x for which $f(x) \geq 3$ or $g(x) < 0$.

Practice PLUS

In Exercises 59–60, write an inequality with x isolated in the middle that is equivalent to the given inequality. Assume $a > 0$, $b > 0$, and $c > 0$.

59. $-c < ax - b < c$
 60. $-2 < \frac{ax - b}{c} < 2$

In Exercises 61–62, use the graphs of y_1 , y_2 , and y_3 to solve each compound inequality.

61. $-3 \leq 2x - 1 \leq 5$

