

1.1 EXERCISES

 PRACTICE

In Exercises 1–9, evaluate the given function for parts **a.–d.**

1. $f(x) = 2x - 7$

- a.** $f(5)$
b. $f(-2)$
c. $f(a + 1)$
d. $f(a) + 1$

2. $f(x) = 3x + 5$

- a.** $f(2)$
b. $f(-1)$
c. $f(a + 1)$
d. $f(a) + 1$

3. $f(x) = x^2 - 2x + 1$

- a.** $f(-2)$
b. $f(3)$
c. $f(a + 1)$
d. $f(a) + 1$

4. $f(x) = 3x^2 - x + 2$

- a.** $f(-3)$
b. $f(2)$
c. $f(a + 1)$
d. $f(a) + 1$

5. $f(x) = x^3 + x^2 - 3x + 1$

- a.** $f(-1)$
b. $f(-3)$
c. $f(a + 1)$
d. $f(a) + 1$

6. $f(x) = 2x^3 - 4x^2 + x - 6$

- a.** $f(-2)$
b. $f(4)$
c. $f(a + 1)$
d. $f(a) + 1$

7. $f(x) = 4x^2 - 1$

- a.** $f(3)$
b. $f(a + 2)$
c. $f(x + h)$
d. $f(-2) - f(-1)$

8. $f(x) = 2 - 3x^2$

- a.** $f(5)$
b. $f(a - 3)$
c. $f(x + h)$
d. $f(3) - f(2)$

9. $f(x) = \sqrt{x + 5}$

- a.** $f(-1)$
b. $f(a + 2)$, where $a \geq -7$
c. $f(x + h)$
d. $f(4) - f(1)$

10. Let $f(x) = \sqrt{x^2 + 1}$. Find **a.** $f(\sqrt{3})$, and **b.** $f(a + 1)$.

11. Let $f(x) = \begin{cases} x - 4 & \text{if } x \leq 2 \\ x^2 - 6 & \text{if } x > 2 \end{cases}$. Find **a.** $f(-1)$, **b.** $f(2)$, **c.** $f(2.5)$, and **d.** $f(3)$.

12. Let $f(x) = \begin{cases} x^2 & \text{if } x < 0 \\ 3x - 2 & \text{if } x \geq 0 \end{cases}$. Find **a.** $f(0)$, **b.** $f(-2)$, **c.** $f(1.5)$, and **d.** $f(3)$.

In Exercises 13–27, find $f(x + h) - f(x)$.

13. $f(x) = 3x - 1$

14. $f(x) = 5x - 2$

15. $f(x) = x^2 + 4$

16. $f(x) = x^2 - 3$

17. $f(x) = 2x^2 + 1$

18. $f(x) = 5 + 3x^2$

19. $f(x) = x^2 - x$

20. $f(x) = x^2 + 2x$

21. $f(x) = 3x - x^2$

22. $f(x) = 4x^2 - x$

23. $f(x) = 2x^2 - 3x$

24. $f(x) = x^3$

25. $f(x) = x^3 - 1$

26. $f(x) = x^3 + 7$

27. $f(x) = x^3 + 5$

In Exercises 28–39, determine the domain of each function.

28. $f(x) = \frac{3x+1}{(x-5)(x-6)}$

29. $f(x) = \sqrt{2x+10}$

30. $f(x) = \sqrt{x^2+2}$

31. $f(x) = \frac{5}{\sqrt{x+10}}$

32. $f(x) = \frac{2x}{x-2}$

33. $f(x) = \frac{x-3}{x+1}$

34. $f(x) = \frac{4}{x^2-x-12}$

35. $f(x) = x-3$

36. $f(x) = 4-3x$

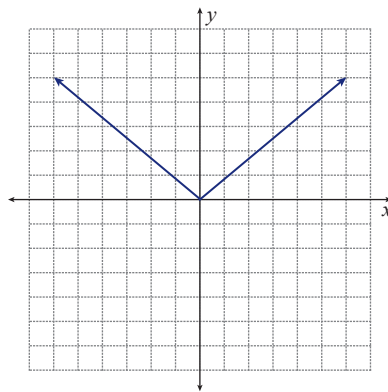
37. $f(x) = \frac{1}{\sqrt{2x+5}}$

38. $f(x) = \begin{cases} 3x+1 & \text{if } 0 \leq x < 4 \\ 5x-2 & \text{if } x \geq 4 \end{cases}$

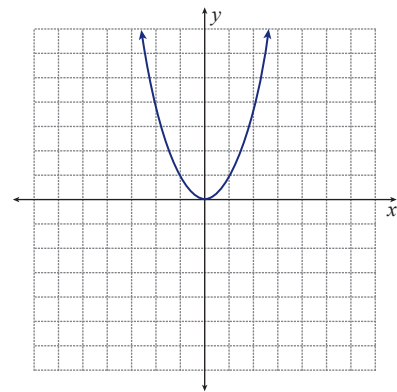
39. $f(x) = \begin{cases} 2-x^2 & \text{if } x \leq 2 \\ x-4 & \text{if } x > 2 \end{cases}$

In Exercises 40–51, use the vertical line test to determine whether or not each graph represents a function.

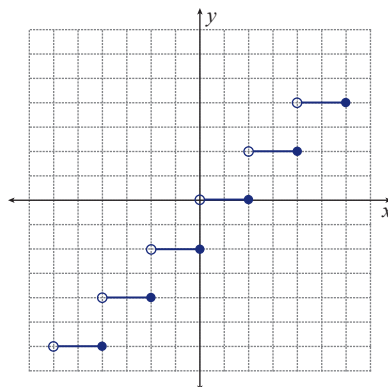
40.



41.



42.



43.

