35. $f(x) = \dfrac{\sqrt{1-x}}{x^2-4}$ **36.** $f(x) = \dfrac{\sqrt{x-1}}{(x+2)(x-3)}$

37. Let f be the function defined by the rule $f(x) = x^2 - x - 6$.
- **a.** Find the domain of f.
- **b.** Compute $f(x)$ for $x = -3, -2, -1, 0, \frac{1}{2}, 1, 2, 3$.
- **c.** Use the results obtained in parts (a) and (b) to sketch the graph of f.

38. Let f be the function defined by the rule $f(x) = 2x^2 + x - 3$.
- **a.** Find the domain of f.
- **b.** Compute $f(x)$ for $x = -3, -2, -1, -\frac{1}{2}, 0, 1, 2, 3$.
- **c.** Use the results obtained in parts (a) and (b) to sketch the graph of f.

In Exercises 39–50, sketch the graph of the function with the given rule. Find the domain and range of the function.

39. $f(x) = 2x^2 + 1$ **40.** $f(x) = 9 - x^2$

41. $f(x) = 2 + \sqrt{x}$ **42.** $g(x) = 4 - \sqrt{x}$

43. $f(x) = \sqrt{1-x}$ **44.** $f(x) = \sqrt{x-1}$

45. $f(x) = |x| - 1$ **46.** $f(x) = |x| + 1$

47. $f(x) = \begin{cases} x & \text{if } x < 0 \\ 2x + 1 & \text{if } x \geq 0 \end{cases}$

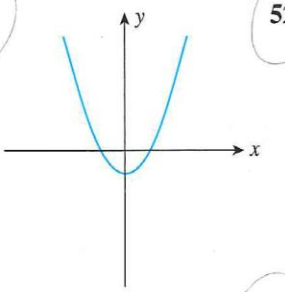
48. $f(x) = \begin{cases} 4 - x & \text{if } x < 2 \\ 2x - 2 & \text{if } x \geq 2 \end{cases}$

49. $f(x) = \begin{cases} -x + 1 & \text{if } x \leq 1 \\ x^2 - 1 & \text{if } x > 1 \end{cases}$

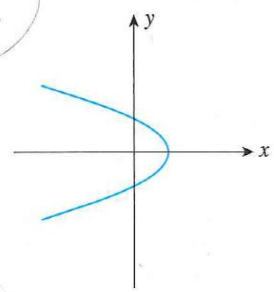
50. $f(x) = \begin{cases} -x - 1 & \text{if } x < -1 \\ 0 & \text{if } -1 \leq x \leq 1 \\ x + 1 & \text{if } x > 1 \end{cases}$

In Exercises 51–58, use the Vertical Line Test to determine whether the graph represents y as a function of x.

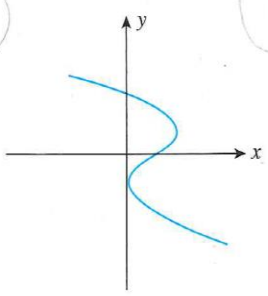
51.



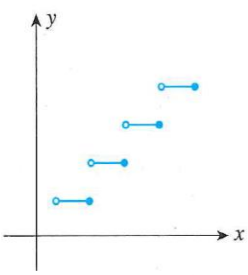
52.



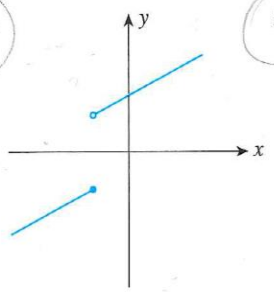
53.



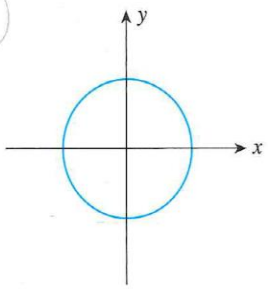
54.



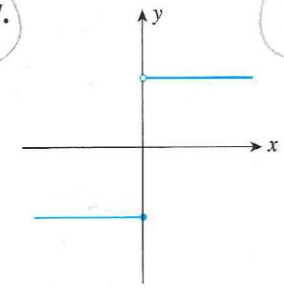
55.



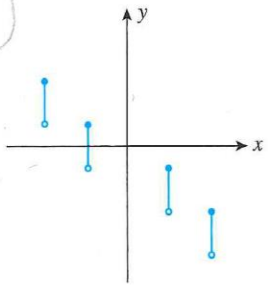
56.



57.



58.



59. The circumference of a circle is given by

$$C(r) = 2\pi r$$

where r is the radius of the circle. What is the circumference of a circle with a 5-in. radius?

60. The volume of a sphere of radius r is given by

$$V(r) = \frac{4}{3}\pi r^3$$

Compute $V(2.1)$ and $V(2)$. What does the quantity $V(2.1) - V(2)$ measure?

61. CONSUMPTION FUNCTION The consumption function in a certain economy is given by

$$C(y) = 0.75y + 6$$

where $C(y)$ is the personal consumption expenditure, y is the disposable personal income, and both $C(y)$ and y are measured in billions of dollars. Find $C(0)$, $C(50)$, and $C(100)$.

62. FRIEND'S RULE Friend's Rule, a method for calculating pediatric drug dosages, is based on a child's age. If a denotes the adult dosage (in milligrams) and if t is the age of the child (in years), then the child's dosage is given by

$$D(t) = \frac{2}{25}ta$$

If the adult dose of a substance is 500 mg, how much should a 4-year-old child receive?