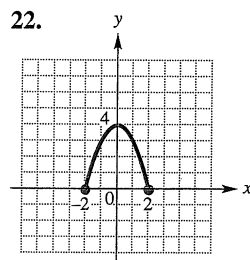
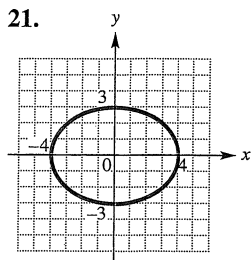
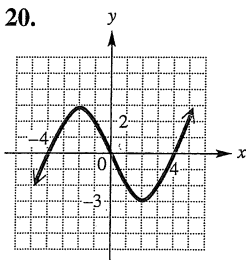
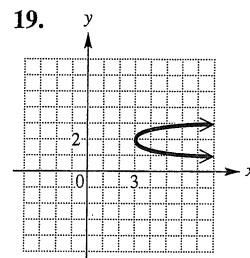
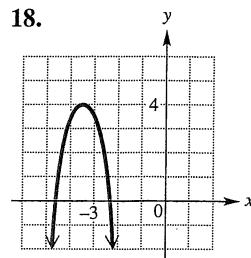
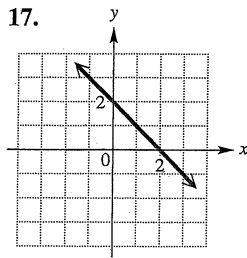


17. function; domain: $(-\infty, \infty)$; range: $(-\infty, \infty)$
 18. function; domain: $(-\infty, \infty)$; range: $(-\infty, 4]$
 19. not a function; domain: $[3, \infty)$; range: $(-\infty, \infty)$
 20. function; domain: $(-\infty, \infty)$; range: $(-\infty, \infty)$
 21. not a function; domain: $[-4, 4]$; range: $[-3, 3]$
 22. function; domain: $[-2, 2]$; range: $[0, 4]$
 23. function; domain: $(-\infty, \infty)$; range: $[0, \infty)$
 24. function; domain: $(-\infty, \infty)$; range: $(-\infty, \infty)$
 25. not a function; domain: $[0, \infty)$; range: $(-\infty, \infty)$
 26. not a function; domain: $[0, \infty)$; range: $(-\infty, \infty)$
 27. function; domain: $(-\infty, \infty)$; range: $(-\infty, \infty)$
 28. function; domain: $(-\infty, \infty)$; range: $(-\infty, \infty)$
 29. not a function; domain: $[0, \infty)$; range: $(-\infty, \infty)$
 30. not a function; domain: $[0, \infty)$; range: $(-\infty, \infty)$
 31. function; domain: $[0, \infty)$; range: $[0, \infty)$
 32. function; domain: $(-\infty, 0] \cup (0, \infty)$; range: $(-\infty, 0] \cup (0, \infty)$
 33. function; domain: $(-\infty, 0] \cup (0, \infty)$; range: $(-\infty, 0] \cup (0, \infty)$
 34. function; domain: $(-\infty, 0] \cup (0, \infty)$; range: $(-\infty, 0] \cup (0, \infty)$
 35. function; domain: $[-\frac{1}{2}, \infty)$; range: $[0, \infty)$
 36. function; domain: $(-\infty, \frac{9}{2}]$; range: $[0, \infty)$
 37. function;
 domain: $(-\infty, 9) \cup (9, \infty)$;
 range: $(-\infty, 0) \cup (0, \infty)$
 38. function;
 domain: $(-\infty, 16) \cup (16, \infty)$;
 range: $(-\infty, 0) \cup (0, \infty)$
 39. B
 40. Here is one example:
 the cost of gasoline; number of gallons used; number of gallons
 41. 4
 42. 13
 43. -11
 44. -59
 45. $-3p + 4$
 46. $-k^2 + 4k + 1$ 47. $3x + 4$



Decide whether each relation defines y as a function of x . Give the domain and range. See Example 5.

23. $y = x^2$ 24. $y = x^3$ 25. $x = y^6$ 26. $x = y^4$
 27. $y = 2x - 6$ 28. $y = -6x + 8$ 29. $x + y < 4$ 30. $x - y < 3$
 31. $y = \sqrt{x}$ 32. $y = -\sqrt{x}$ 33. $xy = 1$ 34. $xy = -3$
 35. $y = \sqrt{4x + 2}$ 36. $y = \sqrt{9 - 2x}$ 37. $y = \frac{2}{x - 9}$ 38. $y = \frac{-7}{x - 16}$

39. **Concept Check** Choose the correct response: The notation $f(3)$ means
 A. the variable f times 3 or $3f$.
 B. the value of the dependent variable when the independent variable is 3.
 C. the value of the independent variable when the dependent variable is 3.
 D. f equals 3.
 40. **Concept Check** Give an example of a function from everyday life. (Hint: Fill in the blanks: _____ depends on _____, so _____ is a function of _____.)

Let $f(x) = -3x + 4$ and $g(x) = -x^2 + 4x + 1$. Find the following. See Examples 6 and 7.

41. $f(0)$ 42. $f(-3)$ 43. $g(-2)$ 44. $g(10)$
 45. $f(p)$ 46. $g(k)$ 47. $f(-x)$ 48. $g(-x)$
 49. $f(x + 2)$ 50. $f(a + 4)$ 51. $f(2m - 3)$ 52. $f(3t - 2)$

For each function, find (a) $f(2)$ and (b) $f(-1)$. See Example 8.

53. $f = \{(-1, 3), (4, 7), (0, 6), (2, 2)\}$ 54. $f = \{(2, 5), (3, 9), (-1, 11), (5, 3)\}$
 55. 56.

