1. If $f(x) = x^2 - x + 1$, find $f(0)$, $f(2)$, $f(-2)$, $f(a)$, $f(-a)$, $f(x+1)$, $f(2x)$, and $2f(x) - 2$.

2. If $f(x) = 1 + \sqrt{x-1}$, find $f(5)$, $f(9)$, $f(a+1)$, $f(-x)$, $f(x^2)$, and $[f(x)]^2$.

3. The graph of a function is given.

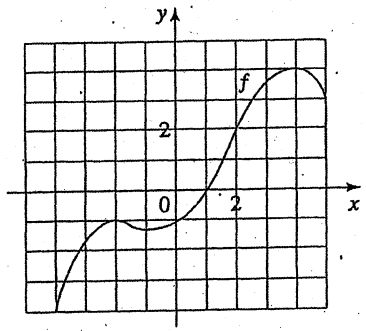
(a) Find $f(-2)$ and $f(2)$.

(b) Find the domain of f.

(c) Find the range of f.

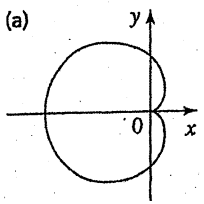
(d) On what intervals is f increasing? On what intervals is f decreasing?

(e) Is f one-to-one?

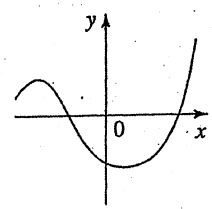


4. Which of the following figures are graphs of functions? Which of the functions are one-to-one?

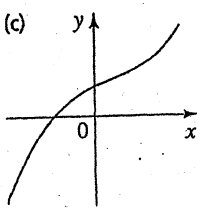
(a)



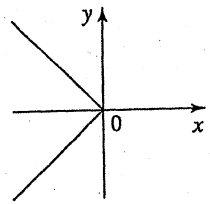
(b)



(c)



(d)



5–6 ■ Find the domain and range of the function.

5. $f(x) = \sqrt{x+3}$

6. $F(t) = t^2 + 2t + 5$

7–14 ■ Find the domain of the function.

7. $f(x) = 7x + 15$

8. $f(x) = \dfrac{2x+1}{2x-1}$

9. $f(x) = \sqrt{x+4}$

10. $f(x) = 3x - \dfrac{2}{\sqrt{x+1}}$

11. $f(x) = \dfrac{1}{x} + \dfrac{1}{x+1} + \dfrac{1}{x+2}$

12. $g(x) = \dfrac{2x^2 + 5x + 3}{2x^2 - 5x - 3}$

13. $h(x) = \sqrt{4-x} + \sqrt{x^2 - 1}$

14. $f(x) = \dfrac{\sqrt[3]{2x+1}}{\sqrt[3]{2x} + 2}$

15–32 ■ Sketch the graph of the function.

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

16. $f(x) = \frac{1}{3}(x-5), \quad 2 \leq x \leq 8$

17. $f(t) = 1 - \frac{1}{2}t^2$

18. $g(t) = t^2 - 2t$

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

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

21. $y = 1 - \sqrt{x}$

22. $y = -|x|$

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

24. $y = \sqrt{x+3}$

25. $h(x) = \sqrt[3]{x}$

26. $H(x) = x^3 - 3x^2$

27. $g(x) = \dfrac{1}{x^2}$

28. $G(x) = \dfrac{1}{(x-3)^2}$

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

30. $f(x) = \begin{cases} 1 - 2x & \text{if } x \leq 0 \\ 2x - 1 & \text{if } x > 0 \end{cases}$

31. $f(x) = \begin{cases} x + 6 & \text{if } x < -2 \\ x^2 & \text{if } x \geq -2 \end{cases}$

32. $f(x) = \begin{cases} -x & \text{if } x < 0 \\ x^2 & \text{if } 0 \leq x < 2 \\ 1 & \text{if } x \geq 2 \end{cases}$

53. Suppose the graph of f is given. Describe how the graphs of the following functions can be obtained from the graph of f.

(a) $y = f(x) + 8$

(b) $y = f(x + 8)$

(c) $y = 1 + 2f(x)$

(d) $y = f(x - 2) - 2$

(e) $y = f(-x)$

(f) $y = -f(-x)$

(g) $y = -f(x)$

(h) $y = f^{-1}(x)$

54. The graph of f is given. Draw the graphs of the following functions.

(a) $y = f(x - 2)$

(b) $y = -f(x)$

(c) $y = 3 - f(x)$

(d) $y = \frac{1}{2}f(x) - 1$

(e) $y = f^{-1}(x)$

(f) $y = f(-x)$