Unit 1 Day 2 HW (2)

(14, 15, 22, 24, 25, 29) + (35-52, omit 44, 45, 51)

13–20 ■ Evaluate the function at the indicated values.

13. $f(x) = 2x + 1$;
omit $f(1), f(-2), f(\frac{1}{2}), f(a), f(-a), f(a + b)$

14. $f(x) = x^2 + 2x$;
$f(0), f(3), f(-3), f(a), f(-x), f(\frac{1}{a})$

15. $g(x) = \frac{1 - x}{1 + x}$;
$g(2), g(-2), g(\frac{1}{2}), g(a), g(a - 1), g(-1)$

21–24 ■ Evaluate the piecewise defined function at the indicated values.

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

22. $f(x) = \begin{cases} 5 & \text{if } x \leq 2 \\ 2x - 3 & \text{if } x > 2 \end{cases}$
$f(-3), f(0), f(2), f(3), f(5)$

23. $f(x) = \begin{cases} x^2 + 2x & \text{if } x \leq -1 \\ x & \text{if } x > -1 \end{cases}$
$f(-4), f(-\frac{3}{2}), f(-1), f(0), f(1)$

24. $f(x) = \begin{cases} 3x & \text{if } x < 0 \\ x + 1 & \text{if } 0 \leq x \leq 2 \\ (x - 2)^2 & \text{if } x > 2 \end{cases}$
$f(-5), f(0), f(1), f(2), f(5)$

25–28 ■ Use the function to evaluate the indicated expressions and simplify.

25. $f(x) = x^2 + 1$; $f(x + 2), f(x) + f(2)$

26. $f(x) = 3x - 1$; $f(2x), 2f(x)$

27. $f(x) = x + 4$; $f(x^2), (f(x))^2$

28. $f(x) = 6x - 18$; $f(\frac{x}{3}), \frac{f(x)}{3}$

29–34 ■ Find $f(a)$, $f(a + h)$, and $\frac{f(a + h) - f(a)}{h}$, where $h \neq 0$.

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

35–52 ■ Find the domain of the function.

35. $f(x) = 2x$

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

37. $f(x) = 2x, \quad -1 \leq x \leq 5$

38. $f(x) = x^2 + 1, \quad 0 \leq x \leq 5$

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

40. $f(x) = \frac{1}{3x - 6}$

41. $f(x) = \frac{x + 2}{x^2 - 1}$

42. $f(x) = \frac{x^4}{x^2 + x - 6}$

43. $f(x) = \sqrt{x - 5}$

omit 44. $f(x) = \sqrt[4]{x + 9}$

omit 45. $f(t) = \sqrt[3]{t - 1}$

46. $g(x) = \sqrt{7 - 3x}$

47. $h(x) = \sqrt{2x - 5}$

48. $G(x) = \sqrt{x^2 - 9}$

49. $g(x) = \frac{\sqrt{2 + x}}{3 - x}$

50. $g(x) = \frac{\sqrt{x}}{2x^2 + x - 1}$

omit 51. $g(x) = \sqrt[4]{x^2 - 6x}$

52. $g(x) = \sqrt{x^2 - 2x - 8}$