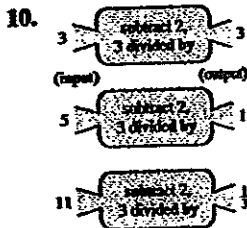
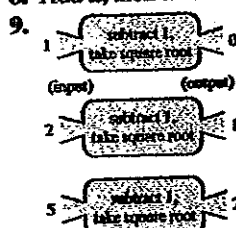


Chapter 3 Solutions

Sec. 3.1

1. $f(x) = 2(x+3)$ 2. $f(x) = \frac{x}{2} - 4$ 3. $f(x) = (x-5)^2$
 4. $f(x) = \frac{1}{3}(\sqrt{x} + 8)$ 5. Subtract 4, then divide by 3
 6. Divide by 3, then subtract 4 7. Square, then add 2
 8. Add 2, then take the square root



11.

x	f(x)
-1	8
0	2
1	0
2	2
3	8

12.

x	g(x)
-3	3
-2	1
0	3
1	5
3	9

13. 3, -3, 2, $2a+1$, $-2a+1$, $2a+2b+1$

14. 0, 15, 3, a^2+2a , x^2-2x , $\frac{1}{a^2} + \frac{2}{a}$

15. $-\frac{1}{3}$, -3, $\frac{1}{3}$, $\frac{1-a}{1+a}$, $\frac{2-a}{a}$, undefined

16. 2, -2, $\frac{5}{2}$, $\frac{5}{2}x + \frac{1}{x}$, $\frac{1}{x} + x$

17. -4, 10, -2, $3\sqrt{2}$, $2x^2+7x+1$, $2x^2-3x-4$

18. 0, -3, -5, $-\frac{45}{8}x^3$, $-\frac{1}{8}x^2$, x^6-4x^4

19. 6, 2, 1, 2, $2|x|$, $2(x^2+1)$

20. -1, -1, not defined, 1, 1, $x/|x|$ 21. 4, 1, 1, 2, 3

22. 5, 5, 5, 3, 7 23. 8, $-\frac{1}{4}$, -1, 0, -1 24. -15, 1, 2, 3, 9

25. x^2+4x+5 , x^2+6 26. $6x-1$, $6x-2$

27. x^2+4 , $x^2+8x+16$ 28. $2x-18$, $2x-6$

29. $3a+2$, $3(a+h)+2$, 3

30. a^2+1 , $a^2+2ah+h^2+1$, $2a+h$

31. 5, 5, 0 32. $\frac{1}{a+1}$, $\frac{1}{a+h+1}$, $\frac{-1}{(a+1)(a+h+1)}$

33. $\frac{a}{a+1}$, $\frac{a+h}{a+h+1}$, $\frac{1}{(a+h+1)(a+1)}$
 34. $\frac{2a}{a-1}$, $\frac{2(a+h)}{a+h-1}$, $\frac{-2}{(a-1)(a+h-1)}$

35. $3-5a+4a^2$, $3-5a-5h+4a^2+8ah+4h^2$,
 $-5+8a+4h$ 36. a^3 , $a^3+3a^2h+3ah^2+h^3$,
 $3a^2+3ah+h^2$ 37. $(-\infty, \infty)$ 38. $(-\infty, \infty)$ 39. $[-1, 5]$

40. $[0, 5]$ 41. $\{x|x \neq 3\}$ 42. $\{x|x \neq 2\}$ 43. $\{x|x \neq \pm 1\}$

44. $\{x|x \neq -3, x \neq 2\}$ 45. $[5, \infty)$ 46. $[-9, \infty)$

47. $(-\infty, \infty)$ 48. $(-\infty, \frac{7}{3}]$ 49. $[\frac{3}{2}, \infty)$

50. $(-\infty, -3] \cup [3, \infty)$ 51. $[-2, 3) \cup (3, \infty)$

52. $[0, \frac{1}{2}) \cup (\frac{1}{2}, \infty)$ 53. $(-\infty, 0] \cup [6, \infty)$

54. $(-\infty, -2] \cup [4, \infty)$ 55. $(4, \infty)$ 56. $(-\infty, 6)$

57. $(\frac{1}{2}, \infty)$ 58. $(-3, 3)$

59. (a) $C(10) = 1532.1$, $C(100) = 2100$ (b) The cost of producing 10 yd and 100 yd (c) $C(0) = 1500$

60. (a) 50.27, 113.10 (b) $S(2)$ is the surface area of a sphere of radius 2, and $S(3)$ is the surface area of a sphere of radius 3.

61. (a) $D(0.1) = 28.1$, $D(0.2) = 39.8$ (b) 41.3 mi

(c) 235.6 mi 62. (a) 50, 0 (b) $V(0)$ is the volume of the full tank, and $V(20)$ is the volume of the empty tank, 20 minutes later.

(c)

x	V(x)
0	50
5	28.125
10	12.5
15	3.125
20	0

63. (a) $v(0.1) = 4440$, $v(0.4) = 1665$

(b) Flow is faster near central axis.

(c)

r	v(r)
0	4625
0.1	4440
0.2	3885
0.3	2960
0.4	1665
0.5	0

65. (a) 8.66 m, 6.61 m, 4.36 m

(b) It will appear to get shorter.

66. (a) $T(5000) = 0$, $T(12,000) = 960$, $T(25,000) = 5350$

(b) The amount of tax paid on incomes of 5000, 12,000, and 25,000

67. (a) \$90, \$105, \$100, \$105

(b) Total cost of an order, including shipping

68. (a) $T(x) = \begin{cases} 75x & \text{if } 0 \leq x \leq 2 \\ 150 + 50(x-2) & \text{if } x > 2 \end{cases}$

(b) \$150, \$200, \$300 (c) Total cost of staying at the hotel

69. (a) $F(x) = \begin{cases} 15(40-x) & \text{if } 0 < x < 40 \\ 0 & \text{if } 40 \leq x \leq 65 \\ 15(x-65) & \text{if } x > 65 \end{cases}$

(b) \$150, \$0, \$150 (c) Fines for violating the speed limits

70.

