

Answers for Lesson 6–4 Exercises

1. $-2, 1, 5$ 2. $-1, 0, 3$
3. $0, 1$ 4. $0, 8$
5. $0, -1, -2$ 6. $0, -3.5, 1$
7. $0, -0.5, 1.5$ 8. $-0.5, 0, 3$
9. $1, 7$ 10. 4.8%
11. about $5.78 \text{ ft} \times 6.78 \text{ ft} \times 1.78 \text{ ft}$
12. $(x + 4)(x^2 - 4x + 16)$
13. $(x - 10)(x^2 + 10x + 100)$
14. $(5x - 3)(25x^2 + 15x + 9)$
15. $3, \frac{-3 \pm 3i\sqrt{3}}{2}$ 16. $-4, 2 \pm 2i\sqrt{3}$ 17. $5, \frac{-5 \pm 5i\sqrt{3}}{2}$
18. $-1, \frac{1 \pm i\sqrt{3}}{2}$ 19. $\frac{1}{2}, \frac{-1 \pm i\sqrt{3}}{4}$ 20. $-\frac{1}{2}, \frac{1 \pm i\sqrt{3}}{4}$
21. $(x^2 - 7)(x - 1)(x + 1)$
22. $(x^2 + 10)(x^2 - 2)$
23. $(x^2 - 3)(x - 2)(x + 2)$
24. $(x - 2)(x + 2)(x - 1)(x + 1)$
25. $(x - 1)(x + 1)(x^2 + 1)$
26. $2(2x^2 - 1)(x + 1)(x - 1)$
27. $\pm 3, \pm 1$ 28. ± 2 29. $\pm 4, \pm 2i$
30. $\pm 3i, \pm \sqrt{2}$ 31. $\pm \sqrt{2}, \pm i\sqrt{6}$ 32. $\pm i\sqrt{5}, \pm i\sqrt{3}$
33. $3.24, -1, -1.24$ 34. $-9, 0$ 35. $-3, -2, 1, 2$
36. $1.71, 0.83$ 37. $0, 1.54, 8.46$ 38. $0, 1.27, 4.73$

Answers for Lesson 6–4 Exercises (cont.)

39. $-1.04, 0, 6.04$
40. $(n - 1)(n)(n + 1) = 210; 5, 6, 7$
41. D
42. $-\frac{6}{5}, \frac{3 \pm 3i\sqrt{3}}{5}$
43. $\frac{4}{3}, \frac{-2 \pm 2i\sqrt{3}}{3}$
44. $\pm 2\sqrt{2}, \pm 2i\sqrt{2}$
45. $\pm 5, \pm i\sqrt{2}$
46. $\pm 3i, \pm i\sqrt{3}$
47. $0, \pm 2, \pm 1$
48. $\pm \sqrt{10}, \pm i\sqrt{10}$
49. $0, \frac{1}{2} \pm \frac{\sqrt{265}}{10}$
50. $4, -2 \pm 2i\sqrt{3}$
51. $0, 3 \pm \sqrt{3}$
52. $-\frac{3}{2}, 0, 4$
53. $-1, 1, \pm i\sqrt{5}$
54. $-3, -2, 2$
55. $-1, 3, 3$
56. $0, 1, 3$
57. $0, 0, 1, 6$
58. $\pm \sqrt{\frac{3}{2}}, \pm i$
59. $\pm \sqrt{2}, \pm i$
60. Check students' work.
61. $V = x^2(4x - 2)$, 4 in. by 4 in. by 16 in.
62. $x = \text{length}$, $V = x(x - 1)(x - 2)$, 5 meters
63. $-\frac{5}{2}, 1; y = (2x + 5)(x - 1)$
64. $\pm 3, \pm 1; y = (x - 1)(x + 1)(x - 3)(x + 3)$
65. $-1, 2, 2; y = (x + 1)(x - 2)^2$
66. $-2, 1, 3; y = (x + 2)(x - 1)(x - 3)$
67. $-4, -1, 3; y = (x + 4)(x + 1)(x - 3)$
68. A cubic can only have 3 zeros.

Answers for Lesson 6–4 Exercises (cont.)

- 69. a.** Answers may vary. Sample: $x^4 - 9 = 0, \pm\sqrt{3}, \pm i\sqrt{3}$
b. No; two of the roots are imaginary.
- 70.** Answers may vary. Sample: The pink block has volume $a^2(a - 3)$, the orange block has volume $9(a - 3)$, the blue block has volume $3a(a - 3)$, and the purple block has volume 27. Thus $a^3 - 27 = a^2(a - 3) + 3a(a - 3) + 9(a - 3) = (a^2 + 3a + 9)(a - 3)$.
- 71. a.** 10
b. 8 and 12