

## Answers for Lesson 6-4 Exercises

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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.  $\pm 2$
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.)

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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.)

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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