Answers for 5.4

For use with pages 356–359

5.4 Skill Practice

1. quadratic

2. It must be written as the product of a monomial and one or more prime polynomials.

3. $7x(2x - 3)$

4. $6b^2(5b - 9)$

5. $c(c + 3)(c + 6)$

6. $z(z - 12)(z + 6)$

7. $3y^3(y - 4)(y + 4)$

8. $9m^3(6m^2 + 2m + 1)$

9. A

10. $(x + 2)(x^2 - 2x + 4)$

11. $(y - 4)(y^2 + 4y + 16)$

12. $(3m + 1)(9m^2 - 3m + 1)$

13. $(5n + 6)(25n^2 - 30n + 36)$

14. $(3a - 10)(9a^2 + 30a + 100)$

15. $(2c + 7)(4c^2 + 14c + 49)$

16. $3(4w - 1)(16w^2 + 4w + 1)$

17. $-5(z - 4)(z^2 + 4z + 16)$

18. $(x + 1)(x^2 + 1)$

19. $(y - 7)(y^2 + 4)$

20. $(n - 3)(n + 3)(n + 5)$

21. $(3m - 1)(m^2 + 3)$

22. $(s - 4)(5s - 1)(5s + 1)$

23. $(c + 2)(2c - 3)(2c + 3)$

24. $(x^2 + 5)(x^2 - 5)$

25. $(a^2 + 1)(a^2 + 6)$

26. $(s^2 - 3)(3s^2 + 8)$

27. $2z(2z - 1)(2z + 1)(4z^2 + 1)$

28. $m^2(6m^2 + 1)^2$

29. $3x(x^2 - 6)(5x^2 + 6)$

30. The equation was not factored correctly, $(a^3 - b^3) = (a - b)(a^2 + ab + b^2)$; $(2x - 3)(4x^2 + 6x + 9) = 0$, $x = \frac{3}{2}$.

31. The factor $3x$ should also be set equal to 0; $x = 0$, or $x = -4$, or $x = 4$.

32. 0, 5

33. $0, -1\frac{2}{3}, 1\frac{2}{3}$

34. $-3, -1, 1$

35. $2, -2, -6$

36. $-1, 1$

37. $0, -\sqrt{21}, \sqrt{21}$

38. -3

39. $-\sqrt{3}, \sqrt{3}, 2, -2$

40. $0, -\frac{3}{4}, \frac{3}{4}$

41. C

42. $2x(2x - 7)(4x + 3)$

43. $(n^2 - 10)(n^2 + 6)$

44. $-4b(b + 5)(b^2 - 5b + 25)$

45. $(12a - 5)(3a^2 + 7)$

46. $c^2(3c + 10)(6c - 1)$

47. $(d + 3)(d - 3)(2d^2 + 5)$

48. $4x^2(2x - 3)(4x^2 + 6x + 9)$

49. $2y^2(y^2 - 5)(4y^2 + 1)$

50. $(z - 2)(z + 2)(z - 3)(z^2 + 4)$

51. 2 **52.** 5 **53.** 5

54. $(xy^2 - 3)(x^2y^4 + 3xy^2 + 9)$

55. $(c + d)(c - d)(7a + b)$

56. $(x^n - 1)^2$

57. $(a^3 - b^2)(ab + 1)^2$

5.4 Problem Solving

58. 3 m

59. 3 cm by 9 cm by 18 cm

60. a. bottom: $48x^3$,
middle: $24x^3$,
top: $8x^3$

b. $1250 = 80x^3$

c. 2.5; bottom: length: 20 ft, width: 15 ft, height: 2.5 ft; middle: length: 15 ft, width: 10 ft, height: 2.5 ft; top: length: 10 ft, width: 5 ft, height: 2.5 ft

61. length: 10 in., width: 5 in., height: 5 in.

62. length: 4 ft, width: 2 ft, height: 12 ft

63. The volume cannot be $\frac{7}{3}$ because the only x-value that corresponds to that volume is about -1.37, which would yield a negative side length.

64. a.

y	1	2	3	4
$y^3 + y^2$	2	12	36	80

y	5	6	7
$y^3 + y^2$	150	252	392

y	8	9	10
$y^3 + y^2$	576	810	1100

b. 4

c. $5\frac{1}{3}$

d. In the first step, multiply by $\frac{a^3}{b^4}$.

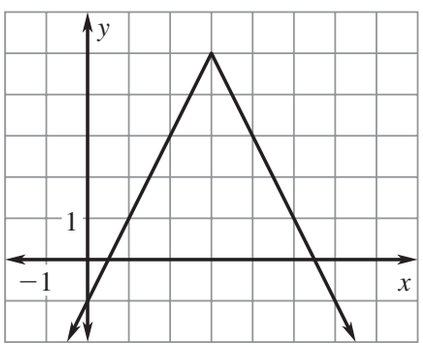
65. a. If there was not a piece of the solid missing, the volume would be a^3. The volume of the piece missing is b^3. So, the volume of the solid is $a^3 - b^3$.

b. solid I: $(a)(a)(a - b)$,
solid II: $(a)(b)(a - b)$,
solid III: $(b)(b)(a - b)$

c. $a^3 - b^3 = (a)(a)(a - b) + (a)(b)(a - b) + (b)(b)(a - b) = (a - b)(a^2 + ab + b^2)$

5.4 Mixed Review

66.



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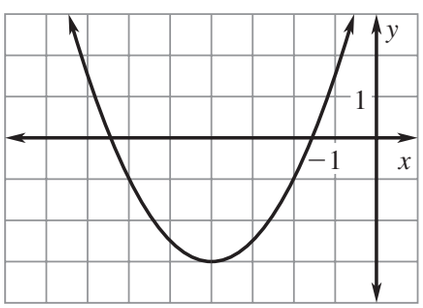

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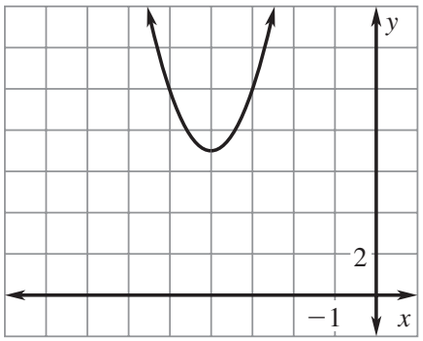

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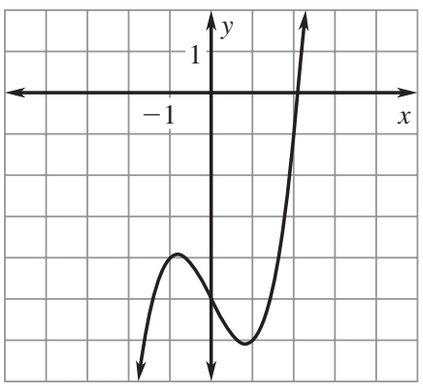

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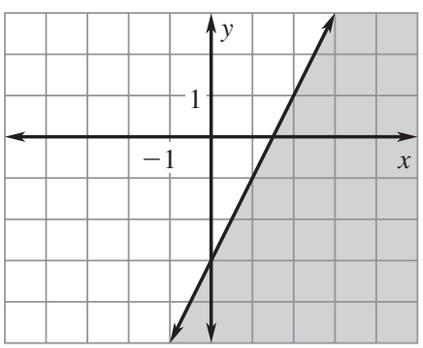

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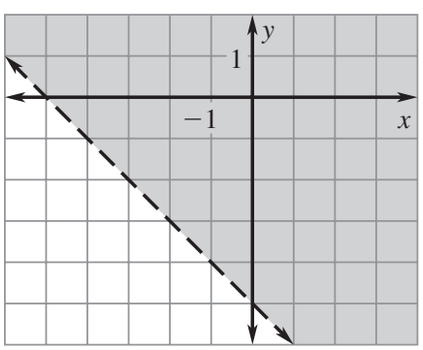

Answers for 5.4 *continued*

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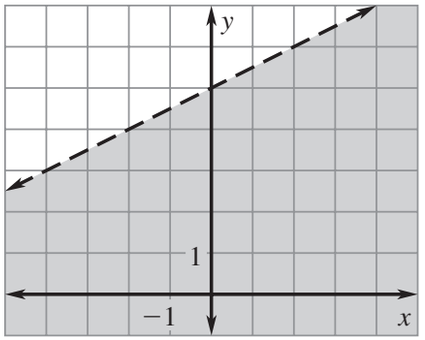
72.



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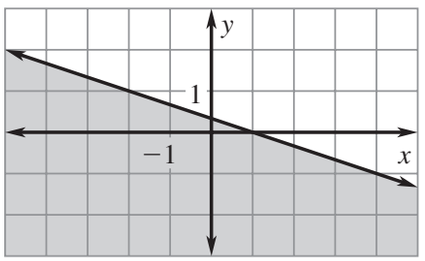

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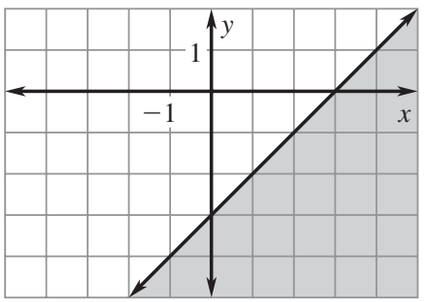

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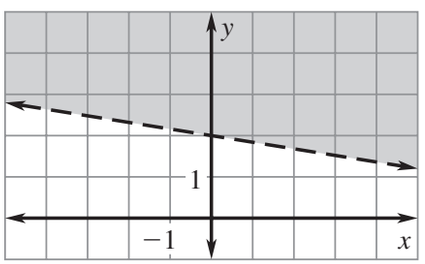

76. 80

77. 646

78. −60

79. −1515