SECTION R.5

32. $(2^2b^2) / a^3$; $a \neq 0, b \neq 0$

42. b^2 ; $b \neq 0$

44. $1 / (b^4)$; $b \neq 0$

46. $x^{12}y^6$; $x \neq 0, y \neq 0$

62. $3ab^2 \sqrt{2a}$

64. $| (ab) / c | \sqrt{(ab) / c}$; $c \neq 0$

SECTION 1.1

14. $4x^2 + 5x - 11$

26. $8a^2 + 22a + 15$

32. $25x^2 - 40xy + 16y^2$

34. $9x^6 - 12x^3y^2 + 4y^4$

36. $x^6 - y^6$

38. $x^3 - 3x^2y + 3xy^2 - y^3$

62. $x^2 - 6 + [(26x + 8) / (x^2 + 3x + 1)]$

84. (a) 21 (b) 38 (c) $48a^4 + 8a^2 + 5$

88. $0, -2, 2, -\sqrt{10}, \sqrt{10}$

SECTION 1.2

12. Not a perfect square

14. $(x - 1)^2$

22. $(2x + 5)(2x - 5)$

24. $(2x^2 + 25)(2x^2 - 25)$

42. $2(x + 5)(x - 5)$

44. $3(x^2 - x + 2)$

56. $5(x - 9)(x - 1)$

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

70. $(4x + 5y)(16x^2 - 20xy + 25y^2)$

SECTION R.4

12. $x = 3$

14. $x = -3$

16. No solution

24. $(a - 1) / (a + 1)$; $a \neq -1, x \neq 0$

34. $(x + 1) / (x - 1)$; $x \neq 1$

60. $(2x + 1) / (x + 2)$; $x \neq -2, x \neq 0$

74. $5/2$; $x \neq 0, x \neq 5/3$

84. $[x(x + 2)] / [(x + 1)(2x + 3)]$; $x \neq -2, x \neq -3/2, x \neq -1$

90. $(b + a) / (b - a)$; $a \neq 0, b \neq 0, a \neq b$

SECTION 1.3

22. $[-h(2x + h)] / [x^2(x + h)^2]$

34. $[x(2x + 1)] / [(x + 3)(x - 3)]$

SECTION 1.4

22. (a) 2 (b) 2 (c) 1/27

24. (a) 25/4 (b) 5 (c) $32\ \sqrt[3]{2}$

28. 1

30. $(3y^{11/6}) / (x^{35/6})$

SECTION 1.5

12. $(x - 2)^{2/3}$

14. $(x + 1)^{15/2}$

20. $(x - 1)^2$

22. $(x - 2)\ \sqrt{x - 2}$

30. $2\ \sqrt[4]{x + 2}$

50. $[(x + 1)\ \sqrt{x - 1} + (x - 1)\ \sqrt{x + 1} - 1] / [(x + 1)(x - 1)]$

SECTION 2.1

12. $x = 13/2$

14. $x = 22/3$

22. All real numbers

30. $x = 13/10$

44. $x = -1/2$

48. $x = -5$

50. No solution

62. $x = 10/9$

88. $x = 1/5$

SECTION 2.2

16. $x < -1/2$
    interval notation: $(-\infty, -1/2)$
    graph: put an open circle over $-1/2$ with an arrow extending to the left

20. $x > 3/2$
    interval notation: $(3/2, \infty)$
    graph: put an open circle over 3/2 with an arrow extending to the right

36. $(-\infty, -2) \cup [0, \infty)$
    graph: Put an open circle over -2 with an arrow extending to the left. Also, put a filled-in circle over 0 with an arrow extending to the right.

38. $(-\infty, -5/4) \cup (2, \infty)$
    graph: Put an open circle over $-5/4$ with an arrow extending to the left. Also, put an open circle over 2 with an arrow extending to the right.

SECTION 2.3

4. The overall discount was \$23.75. This is roughly a 30% discount.

14. Driver A should start out 36 min. before 7 PM – in other words, at 6:24 PM. Driver B should start out 24 min. before 7 PM – in other words, at 6:36 PM.

24. At most 0.80 liters of water can be added.

44. The other number is 5.

SECTION 2.4

22. $5\sqrt{2} + \sqrt{61} + \sqrt{17}$

24. $x = -9$

38. $P_2(8,1)$

SECTION 2.5

12. $m = -1/2$

18. $x = 5/3$

24. $y + 3 = -4/7\ (x - 6)$ or $y - 1 = -4/7\ (x + 1)$

28. $y = -2x - 5$

36. $m = 0$; y-intercept: $(0, -5/2)$

38. $m = 1$; y-intercept: $(0,0)$

SECTION 2.6

14. parallel

34. $(30/13, 24/13)$

36. $(2,3)$

40. (24/17, -22/17)

52. The cost of 1 pound of sugar is 45 cents.
The cost of 1 pound of flour is 50 cents.

54. The speed of the plane is 550 mph. The speed of the wind is 50 mph.

SECTION 2.7

14. (3,2,4)

SECTION 3.1

22. $x = 0,\ x = -b/a$

SECTION 3.2

No even problems assigned.

SECTION 3.3

12. $x = \sqrt[3]{5},\ x = 1$

14. $x = 25/9$

34. $x = 4$

36. $x = 0,\ x = 4$

SECTION 3.4

24. $x = 1$

Additional Problem #1: $x / (x + 1) \leq 0$
Solution: $(-\infty, -1) \cup [0, \infty)$

Graph: Put an open circle over –1 with an arrow extending to the left. Also, put a filled-in circle over 0 with an arrow extending to the right.

Additional Problem #2: $(x^2 - 1) / (x^2 + 5x + 6) \leq 0$
Solution: $(-3, -2) \cup [-1, 1]$
Graph: Put open circles above –3 and –2 and draw a line segment connecting them. Then put filled-in circles over –1 and 1 and draw a line segment connecting them.

Additonal Problem #3: $x^2 / (x - 2) > 0$
Solution: $(2, \infty)$
Graph: Put an open circle above 2 with an arrow extending to the right.

SECTION 3.5

16. The object will be at least 144 feet above the ground between 2 and 4 seconds.

SECTION 3.6

14. $(x + 1)^2 + (y + 1)^2 = 8$

22. Circle with center (-3,1) and radius 5

24. Circle with center (2, -2) and radius $(3\sqrt{2}) / 2$

26. Empty set

40. vertex: (3, -4)
    axis of symmetry: x = 3
    Parabola opens upward

42. vertex: (1, -1/2)
    axis of symmetry: x = 1
    Parabola opens downward

56. (a) Discriminant is positive and a is negative

(b) Discriminant is negative and a is positive
(c) Discriminant is zero and a is negative
(d) Discriminant is positive and a is positive

SECTION 4.1

16. All real numbers except for 5/2; in other words, $(-\infty, 5/2) \cup (5/2, \infty)$

Domain of $1 / \sqrt{2x - 5}$: $(5/2, \infty)$

20. All real numbers; in other words, $(-\infty, \infty)$

24. All real numbers except for 1 and 2; in other words,
$(-\infty, 1) \cup (1,2) \cup (2, \infty)$

32. (a) $t^2 + 2t + 3$ (b) $x + 2\sqrt{x} + 3$
(c) $x^4 + 2x^2 + 3$ (d) $x^2 + 4x + 6$
(e) $x + 3$ (f) $2x + h + 2$

46. Function

48. Not a function

SECTION 5.1

42. 16

44. 1

46. a^3 / b

48. 1