Answers for 8.6

8.6 Skill Practice

1. cross multiplying

2. 4; 4 is not in the domain of the equation because you cannot divide by zero.

3. Graph both sides of the equation. If the graphs intersect at a possible solution, then it is a solution. If the graphs do not intersect at a possible solution, then it is an extraneous solution.

4. 4 **5.** 6 **6.** 5

7. 2 **8.** 3 **9.** -1

10. ± 1 **11.** no solution

12. 6 **13.** A **14.** 1, 4

15. 4 **16.** $\dfrac{-3 \pm \sqrt{129}}{4}$

17. $-\dfrac{7}{3}$ **18.** 1, 6

19. $\dfrac{-1 \pm \sqrt{79}}{3}$ **20.** $-2, 3$

21. 1 **22.** $-\dfrac{3}{2}, 2$

23. $-\dfrac{5}{2}, 8$ **24.** no solution

25. 0, 7

26. The student "cross multiplied" the fractions on the left side of the equation. Both sides of the equation should have been multiplied by the LCD, $2x^2$;
$$2x^2\left(\dfrac{3}{2x} + \dfrac{4}{x^2}\right) = 2x^2(1),$$
$$6x + 8 = 2x^2.$$

27. The student simply added numerators and denominators on the left side of the equation. Both sides of the equation should have been multiplied by the LCD, $6x$;
$$6x\left(\dfrac{5}{x} + \dfrac{23}{6}\right) = 6x\left(\dfrac{45}{x}\right),$$
$$30 + 23x = 260.$$

28. C

29. *Sample answer:* $\dfrac{6}{x + 5} = \dfrac{2x}{x - 1}$;
$$\dfrac{4}{x} + \dfrac{5}{3} = \dfrac{12}{x}$$

30. Always true; when $x = a$, the denominators of the fractions are zero.

31. Sometimes true; the equation will have exactly one solution except when $x = a$.

32. Always true; the only apparent solution is an extraneous solution.

8.6 Problem Solving

33. 26 serves

34. a. $\dfrac{9}{4.38 + x} = \dfrac{8}{x}$

b. Skater 1: 39.42 km/h,
Skater 2: 35.04 km/h

c. About 13.7 min. *Sample answer:* Divide the distance, 9 kilometers, by the rate, 39.42 kilometers per hour, to find the time.

35. 1995

36. a. $\dfrac{5}{8}, \dfrac{5}{t}$

b. $\dfrac{5t + 40}{8t}$; the expression represents the amount of work done by you and your friend while working together for 5 hours.

c. $\dfrac{5}{t} = \dfrac{3}{8} \rightarrow t = 13\dfrac{1}{3}$ h; when working together, you and your friend can complete one room.
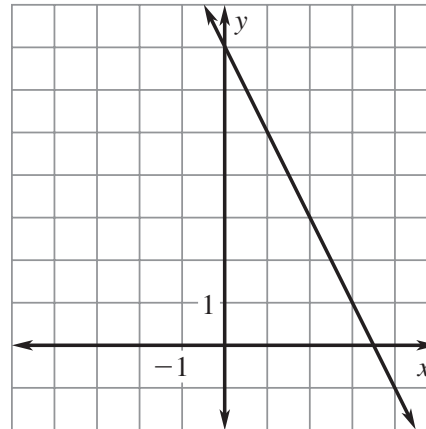
37. $\dfrac{1 + \sqrt{5}}{2}$

38. a.
$$f(x) = \dfrac{-0.27x^3 + 1.4x^2 + 1.05x + 39.4}{-8.25x^3 + 53.1x^2 - 7.82x + 138}$$
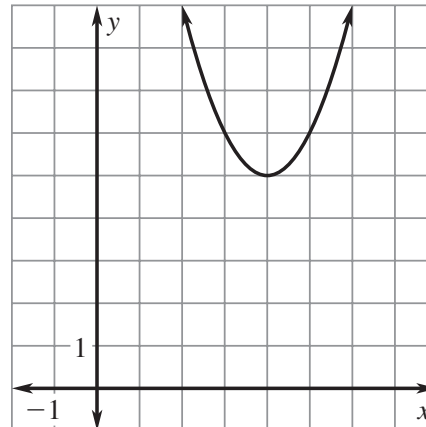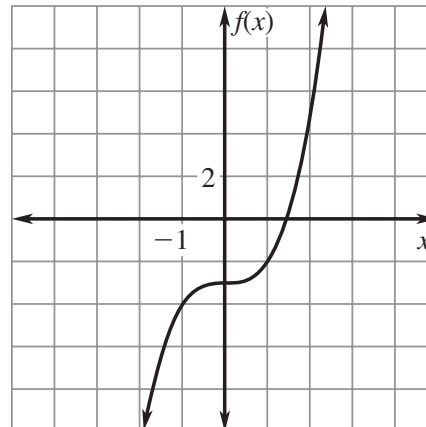
b. about $.29 per min

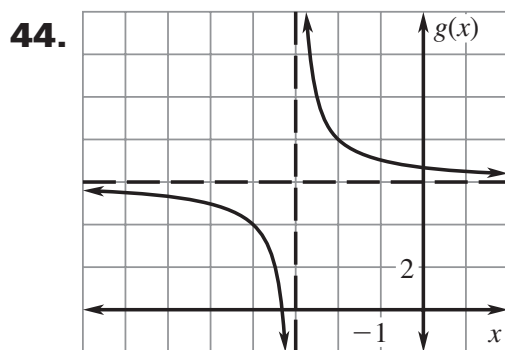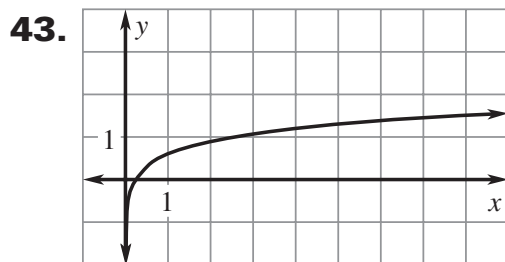**c.** 2002

8.6 Mixed Review

39.

40.

41.

42.

43.

44.
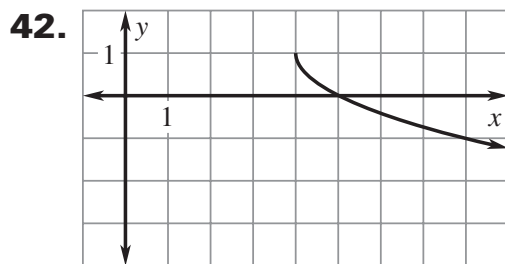
45. $2\sqrt{13}$ **46.** $2\sqrt{6}$

47. $5\sqrt{5}$ **48.** $6\sqrt{7}$

49. $12\sqrt{5}$ **50.** 20

51. $\dfrac{\sqrt{10}}{5}$ **52.** $\dfrac{2\sqrt{15}}{3}$

8.4–8.6 Mixed Review of Problem Solving

1. a. $t = \dfrac{50}{s}$

   b. $t = \dfrac{50}{s + 5}$

   c. $t = \dfrac{50(2s + 5)}{s(s + 5)}$

2. 5 mi/h

3. a. rectangular container: $\dfrac{2(r + h)}{rh}$,

   cylinder: $\dfrac{2(r + h)}{rh}$

   b. The two containers are equally efficient.

4. *Sample answer:*

   $r(x) = \dfrac{x^2 - x - 6}{x + 2}$,

   $s(x) = \dfrac{x + 2}{x^2 + 6x + 8}$

5. a. amount of copper $=$

   $\dfrac{\text{amount of zinc}}{\% \text{ zinc}} - \text{amount of zinc};$

   $25 = \dfrac{x}{0.45} - x$

   b. $20\dfrac{5}{11}$ oz

   c. $x = 0.818c$

6. a. $\dfrac{120}{x + 10} = \dfrac{100}{x}$

   b. car: 60 mi/h, truck: 50 mi/h

   c. 2 h. *Sample answer:* The car traveled 120 miles at a rate of 60 miles per hour, so $\dfrac{120}{60} = 2$ hours.

7. 0.52;

	.	5	2
	⊘	⊘	
⊙	⊙	⊙	⊙
	0	0	0
1	1	1	1
2	2	2	**2**
3	3	3	3
4	4	4	4
5	5	**5**	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9