Answers for 2.5

For use with pages 99–101

2.5 Skill Practice

1. 4, -9

2. No; the 2 was not distributed to the 1, $2(x + 1) = 2x + 2$.

3. The negative was not distributed to the -8;
$5y - (2y - 8) = 5y - 2y + 8$
$= 3y + 8$.

4. Unlike terms cannot be combined;
$8 + 2(4 + 3x) = 8 + 8 + 6x$
$= 16 + 6x$.

5. $4x + 12$ **6.** $8y + 16$

7. $5m + 25$ **8.** $3n + 18$

9. $-8p + 24$ **10.** $-4q + 16$

11. $4r - 6$ **12.** $9s - 81$

13. $6v^2 + 6v$ **14.** $-2w^2 - 7w$

15. $2x^2 - 6x$ **16.** $3y^2 - 18y$

17. $\frac{1}{4}m - 2$ **18.** $-\frac{3}{4}p + \frac{3}{4}$

19. $4n - 6$ **20.** $\frac{5}{6}r^2 - \frac{5}{6}r$

21. terms: -7, $13x$, $2x$, 8;
like terms: -7 and 8, $13x$ and $2x$;
coefficients: 13, 2;
constant terms: -7, 8

22. terms: 9, $7y$, -2, $-5y$;
like terms: 9 and -2, $7y$ and $-5y$;
coefficients: 7, -5;
constant terms: 9, -2

23. terms: $7x^2$, -10, $-2x^2$, 5;
like terms: $7x^2$ and $-2x^2$, -10 and 5; coefficients: 7, -2;
constant terms: -10, 5

24. terms: $-3y^2$, $3y^2$, -7, 9;
like terms: $-3y^2$ and $3y^2$, -7 and 9; coefficients: -3, 3;
constant terms: -7, 9

25. terms: 2, $3xy$, $-4xy$, 6;
like terms: 2 and 6, $3xy$ and $-4xy$;
coefficients: 3, -4;
constant terms: 2, 6

26. terms: $6xy$, $-11xy$, $2xy$, $-4xy$, $7xy$; like terms: $6xy$, $-11xy$, $2xy$, $-4xy$, and $7xy$;
coefficients: 6, -11, 2, -4, 7;
constant terms: none

27. B **28.** $-4x$ **29.** $5y$

30. $2n + 7$ **31.** $9a - 2$

32. $6 - 4c$ **33.** $8r + 8$

34. $14t + 4$ **35.** $3m + 5$

36. $-5v - 6$ **37.** $10w - 35$

38. $30 - 4z$ **39.** $15s + 6$

40. $2v + 16$; $5v + 15$

41. $34 - 24w$; $72 - 108w$

42. $2x + 5.4$; $2.1x + 1.26$

43. \$38.94 **44.** \$19.95

45. \$11.88 **46.** \$74.50

47. $2(6 + x) + (x - 5)$; $3x + 7$

48. $3(x - 2) - (x + 10)$; $2x - 16$

49. $(b + c)a = a(b + c)$, Commutative property of multiplication; $= ab + ac$, Given statement; $= ba + ca$, Commutative property of multiplication

2.5 Problem Solving

50. $s = -a + 60$; 58

51. $C = 3r - 6$; \$5.97

52. $C = 2.5 + 0.1(m - 10)$; 10 minutes today and 15 minutes tomorrow; the cost of using the phone 10 minutes today and 15 minutes tomorrow is $2.5 + 2.5 + 0.1(5) = \$5.50$; the cost of using the phone for 25 minutes today is $2.5 + 0.1(15) = \$4$.

53. $s = d(x + y + z)$

54. a. $y = -15x + 700$

b. \$475

c. You do not need to teach any advanced students.

Number of beginner students	Weekly pay (dollars)
15	475
16	460
17	445
18	430
19	415
20	400

You need to earn \$4000 ÷ 10 = \$400 a week. A table of values shows how much you can earn based on the number of beginner students you teach.

55. $r = \frac{8}{3}a + \frac{1000}{3}$

2.5 Mixed Review

56. $\frac{1}{5}$ **57.** $\frac{1}{14}$ **58.** $3\frac{5}{6}$

59. $\frac{2}{3}$ **60.** $1\frac{1}{2}$ **61.** $1\frac{9}{13}$

62. -11 **63.** -3 **64.** -11

65. -15 **66.** 23.1 **67.** 52.5

Answers for 2.6

For use with pages 106–108

2.6 Skill Practice

1. multiplicative inverse

2. If their sum is negative, the mean will be negative.

3. $-\frac{1}{18}$ **4.** $-\frac{1}{9}$ **5.** -1

6. -2 **7.** $-1\frac{1}{3}$ **8.** $-1\frac{4}{5}$

9. $-\frac{3}{13}$ **10.** $-\frac{5}{12}$ **11.** -7

12. 3 **13.** $\frac{2}{7}$ **14.** -20

15. -3 **16.** $-\frac{1}{3}$ **17.** $-2\frac{1}{2}$

18. $\frac{1}{30}$ **19.** $\frac{2}{7}$ **20.** $\frac{5}{6}$

21. -22 **22.** $-\frac{1}{5}$ **23.** A

24. -5 **25.** $-1\frac{2}{3}$ **26.** 1

27. $2\frac{1}{4}$ **28.** 0 **29.** $-2\frac{1}{5}$

30. -2 **31.** 0.1 **32.** 0.416

33. $3x - 7$ **34.** $-3y + 2$

35. $-3z + 2$ **36.** $-p + 2\frac{1}{2}$

37. $\frac{1}{2} - 2\frac{1}{2}q$ **38.** $3\frac{1}{4}r$

39. $3a + 1\frac{1}{4}$ **40.** $4b - 2\frac{2}{5}$

41. $4 - 3c$

42. The multiplicative inverse of 6 is $\frac{1}{6}$, not $-\frac{1}{6}$;

$$\frac{12 - 18x}{6} = (12 - 18x) \cdot \left(\frac{1}{6}\right)$$

$$= 12\left(\frac{1}{6}\right) - 18x\left(\frac{1}{6}\right)$$

$$= 2 - 3x.$$

43. -2 was added instead of subtracted;

$$\frac{-15x - 10}{-5}$$

$$= (-15x - 10) \cdot \left(-\frac{1}{5}\right)$$

$$= -15x\left(-\frac{1}{5}\right) - 10\left(-\frac{1}{5}\right)$$

$$= 3x + 2.$$

44. -9 **45.** $-1\frac{1}{3}$

46. 9 **47.** $\frac{1}{3}$

48. No; no. *Sample answer:* $4 \div 2 = 2$ but $2 \div 4 = \frac{1}{2}$, $(20 \div 4) \div 2 = 2\frac{1}{2}$ but $20 \div (4 \div 2) = 10$.

49. C

50. -5. *Sample answer:* Using additive inverses you can determine that the sum of the integers -400 to 400 is 0. The sum of the integers from -410 to -401 is -4055. Divide this sum by the number of integers from -410 to 400, which is 811; $-4055 \div 811 = -5$.

51. The opposite of the number; if you add x and 3 times $-x$, you get $-2x$; $-2x \div 2 = -x$.

2.6 Problem Solving

52. $-\frac{7}{10}$ m/sec **53.** $-14.75°C$

54. a. \$.06; \$.17

b. stock B; \$.11

c. Yes. *Sample answer:* Over the first four days, stock A's average change in value was -0.3075 whereas stock B's was -0.0425.

55. A

56. a. -0.62 meter per year

b. About 24.74 m. *Sample answer:* Find the average rate of change based on the actual elevation in 2002, -0.72; use the equation $30.5 + (-0.72)(8)$ to predict the elevation on 2010.

57. a. -0.034

b. Yes; it will improve to -0.012.

c. If the player had the same number of aces as service errors, then $a = e$, so $f = \frac{a - a}{s} = 0$; if all the serves were aces, a would be equal to s and e would be 0, so $f = \frac{s - 0}{s} = \frac{s}{s} = 1$; if all the serves were errors, then $e = s$ and $a = 0$, so $f = \frac{0 - s}{s} = \frac{-s}{s} = -1$.

58. $-\$27.33$

2.6 Mixed Review

59. 90 **60.** 26

61. 5 **62.** -11.2

63. Hypothesis: a number is a whole number, conclusion: the number is a rational number; true.

64. Hypothesis: a number is a rational number, conclusion: the number is an integer; false. *Sample answer:* $\frac{2}{3}$ is a rational number, but not an integer.

Answers for 2.7

For use with pages 113–119

2.7 Skill Practice

1. real numbers

2. If it is not a perfect square, the square root is irrational.

3. 2	**4.** -7	**5.** -3
6. ± 1	**7.** 14	**8.** ± 11
9. ± 50	**10.** -16	**11.** -15
12. 19	**13.** ± 13	**14.** -40
15. 3	**16.** -4	**17.** -2
18. 12	**19.** -9	**20.** 6
21. 14	**22.** -8	**23.** B

24. $\sqrt{49}$: real number, rational number, integer, whole number, 8: real number, rational number, integer, whole number, $-\sqrt{4}$: real number, rational number, integer, -3: real number, rational number, integer; -3, $-\sqrt{4}$, $\sqrt{49}$, 8

25. $-\sqrt{12}$: real number, irrational number, -3.7: real number, rational number, $\sqrt{9}$: real number, rational number, integer, whole number, 2.9: real number, rational number; -3.7, $-\sqrt{12}$, 2.9, $\sqrt{9}$

26. -11.5: real number, rational number, $-\sqrt{121}$: real number, rational number, integer, -10: real number, rational number, integer, $\frac{25}{2}$: real number, rational number, $\sqrt{144}$: real number, rational number, integer, whole number; -11.5, $-\sqrt{121}$, -10, $\sqrt{144}$, $\frac{25}{2}$

27. $\sqrt{8}$: real number, irrational number, $-\frac{2}{5}$: real number, rational number, -1: real number, rational number, integer, 0.6: real number, rational number, $\sqrt{6}$: real number, irrational number; -1, $-\frac{2}{5}$, 0.6, $\sqrt{6}$, $\sqrt{8}$

28. $-\frac{8}{3}$: real number, rational number, $-\sqrt{5}$: real number, irrational number, 2.6: real number, rational number, -1.5: real number, rational number, $\sqrt{5}$: real number, irrational number; $-\frac{8}{3}$, $-\sqrt{5}$, -1.5, $\sqrt{5}$, 2.6

29. -8.3: real number, rational number, $-\sqrt{80}$: real number, irrational number, $-\frac{17}{2}$: real number, rational number, -8.25: real number, rational number, $-\sqrt{100}$: real number, rational number, integer; $-\sqrt{100}$, $-\sqrt{80}$, $-\frac{17}{2}$, -8.3, -8.25

30. If a number is a whole number, then it is a real number; true.

31. If a number is a real number, then it is an irrational number; false. *Sample answer:* 3 is a real number and a rational number.

32. If a number is a perfect square, then it is not a whole number; false. *Sample answer:* 9 is a perfect square and a whole number.

33. If a number is an irrational number, then it is not a whole number; true.

34. 6 **35.** 2 **36.** 28

37. -42 **38.** -40 **39.** 63

40. $\frac{1}{2}$ **41.** -16

42. *Sample answer:* -5, -4.5, -4; $-\sqrt{26}$ is a little less than -5 and $-\sqrt{15}$ is a little more than -4, therefore -4, -4.5, and -5 are between $-\sqrt{26}$ and $-\sqrt{15}$.

43. B

44. *Sample answer:* If $x^2 = a$, then x is the square root of a, therefore $\sqrt{x^2}$ is x; $\sqrt{4^2} = \sqrt{16} = 4$; $\sqrt{3^2} = \sqrt{9} = 3$; $\sqrt{2^2} = \sqrt{4} = 2$.

45. 4, 64, 324, 1024, 2500; take $\frac{1}{2}$ of an even perfect square, and then square it.

46. 31; the square root of 1000 is between 31 and 32, so there are 31 perfect squares less than 1000.

2.7 Problem Solving

47. 60 in. **48.** 40 yd

49. 35 ft; 24 ft; 48 ft; 30 ft; they are all rational numbers.

50. No; each side is a little more than 38 feet. 38 feet times 4 is 152 feet, which is more than 150 feet.

51. 3; square each fraction, $\left(\frac{265}{153}\right)^2 < 3$, $\left(\frac{1351}{780}\right)^2 > 3$ so the value of x is 3.

52. **a.** 290 K **b.** 342 m/sec

53. a. 144 tiles

b. 16 ft. *Sample answer:* If the homeowner can buy 144 tiles that are each 256 square inches, then the total area is (144 tiles) • (256 square inches per tile) = 36,864 square inches. Divide 36,864 square inches by 144 square inches to find the number of square feet, 256 square feet. If the area of the square is 256 square feet, take the square root of 256 to find the side length, 16 feet.

54. a.

Quotient of pyramids	Quotient of area of bases	Quotient of side length of bases
$\frac{\text{Khafre}}{\text{Menafaure}}$	3.9	2.0
$\frac{\text{Khufu}}{\text{Menafaure}}$	4.6	2.1
$\frac{\text{Khufu}}{\text{Khafre}}$	1.2	1.1

The quotient of the areas is the square of the quotient of the side lengths.

b. $q = \sqrt{r}$

55. $\ell = \sqrt{\frac{A}{6}}$

2.7 Mixed Review

56. 14 **57.** 9 **58.** 35

59. 120 **60.** 51 **61.** 59

62. 63 **63.** 17 **64.** 5

65. 35 **66.** 8 **67.** 35

68. 44 **69.** 16 **70.** 90

71. 8

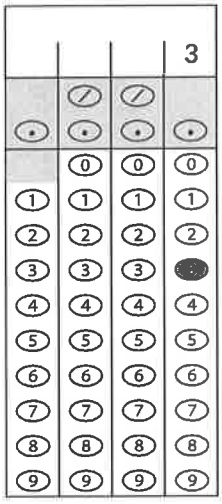
2.4–2.7 Mixed Review of Problem Solving

1. a. 1104 points **b.** 354 points

2. a. $T = 15 + (-0.0065)e$

b. $-56.5°C$

3. 3 in.;



4. a. 40 cm; 35 cm

b. The yellow bin.
Sample answer: For each bin, divide the cost by the surface area; the yellow bin costs less per cubic centimeter.

5. a. $c = -3.29x$; $-\$13.16$

b. No; it depends on the amount of change for each item.

6. a. $C = 4x + 5600$

b. \$6000

c. Yes; the cost will be \$6200.

7. *Sample answer:* A stock increases in value by \$8.90 one week, decreases by \$2.34 the next week and decreases \$1.15 the following week. The expression

$$\frac{8.90 + (-2.34) + (-1.15)}{3}$$

represents the stock's average change over 3 weeks; \$1.80.