Chapter 4 Summary

Section 4.1

• Evaluating variable expressions
• Evaluating formulas

Section 4.2

• Identifying properties of numbers
• Combining expressions using like terms
• Simplifying expressions using the distributive properties

Section 4.3

• Using the Addition property of equations to solve equations
• Using the Multiplication property of equations to solve equations
• Solving equations containing fractions and decimals
• Solving equations of the form $ax + b = c$

Section 4.4

• Solving equations of the form $ax + b = cx + d$
• Solving equations containing fractions and decimals
• Solving equations using the distributive property to simplify
• Interpreting answers as no solution or any number

Section 4.5

• Solving number application problems
• Solving perimeter application problems
• Solving triangle application problems
• Solving age application problems
• Solving value application problems
Chapter 4 Review Exercises

Find the value of each expression when \( x = 3 \) and \( y = -4 \).

1. \( 6x - 9y \)
2. \( -5xy^2 \)
3. \( 4y^2 - 6xy \)
4. \( \frac{3y^2}{2x - 3y} \)

Find the value for each variable expression when \( a = 5 \) and \( b = -4 \).

5. \( X = 3a - 7b \)
6. \( W = -3ab - 6b^2 \)
7. \( Y = \frac{3a - 4b}{6a^2b} \)
8. \( Q = \frac{4a - 5b}{4a + 5b} \)

Find the value of each expression when \( s = -\frac{3}{4} \) and \( t = \frac{1}{3} \):

9. \( -6st \)
10. \( -5s + 7t \)
11. \( -4st - 5t^2 \)
12. \( \frac{3s + t^2}{s^2 - 4t} \)

Evaluate the following formulas given the variable values.

13. \( P = 2w + 2l \); \( w = 3.2, l = 4.5 \)
14. \( A = \pi r^2 \); \( \pi = 3.14, r = 8 \)
15. \( S = 2\pi rh \); \( \pi = 3.14, r = 5, h = 12 \)
16. \( A = lw \); \( l = 15, w = 9 \)
17. \( A = P(1 + r)^t \); \( P = 2500, r = 0.09, t = 10 \) (round answer to nearest hundredth)
Answer each of the following application problems.

18. The formula \( A = P\left(1 + \frac{r}{n}\right)^t \) is used in investment computation. Compute the value of \( A \) when \( P = $15000, r = 0.065, n = 4, \) and \( t = 20 \).

19. The formula \( C = \frac{5}{9}(F - 32) \) is used to convert temperature from Fahrenheit to Celsius. Compute the value of \( C \) when \( F = -13^\circ \).

20. The formula \( F = p\left[\left(1 + \frac{i}{n}\right)^n - 1\right]/i \) is used in investment computation. Compute the value of \( F \) when \( p = $5000, i = 0.11, \) and \( n = 25 \). Use a calculator and round your answer to the nearest hundredth.

Apply the commutative and/or associative properties to rewrite and simplify each expression.

21. \(-13 + (8 - 14x)\)  
22. \(13b \cdot (-12b)\)  
23. \(-\frac{3}{4}a \cdot \frac{4}{15}a\)  
24. \(\left(-\frac{5}{6}y\right)^2\)

Give the full name of the property illustrated by each statement.

25. \(7x + (-7x) = 0\)  
26. \(25y \cdot 0 = 0\)  
27. \(-4(9x) = -36x\)  
28. \(-\frac{2}{5x} \cdot \left(-\frac{5x}{2}\right) = 1\)  
29. \(-6(a - 7) = -6a + 42\)  
30. \(-8w + 0 = -8w\)

Use the idea of like terms to combine the terms.

31. \(-5y^2 - 9y^2\)  
32. \(-29x^2y^3 - 35x^2y^3\)  
33. \(3x + 3y - 5x - 9y\)  
34. \(-12a^2b^3 - 6a^2b^3 + 7a^3b^2\)

Simplify the following expressions.

35. \(4x^2 + 3x - 7 - 9x^2 + 6x + 11\)  
36. \(-7a + 3ab + 6b - 12a - 7ab - 4b\)  
37. \(-17u^2 - 9uv + 6v^2 + 7u^2 - 7uv - 15v^2\)  
38. \(\frac{1}{3}x - \frac{1}{4}xy + \frac{1}{6}y - \frac{3}{4}x - \frac{1}{2}xy - y\)
Simplify the following expressions by applying the distributive property.

39. \( 7(6x^2 - 9x - 13) \)  
40. \(-5(6a^2 - 8a - 16)\)

41. \( 2.5(3.4y^2 - 1.6y - 7) \)  
42. \( 5x(7x - 12y - 8xy + 2) \)

Simplify the following expressions.

43. \( 8(4a - 7b) - 7(-3a + 5b) \)  
44. \( 3(y^2 - 5y - 4) - 4(2y^2 - 6y - 5) \)

45. \(-6(0.7x - 1.3y) + 7(0.8x - 1.4y) \)  
46. \( \frac{1}{3} \left( \frac{2}{3}a - \frac{3}{4}b \right) - \frac{1}{4} \left( \frac{4}{5}a - \frac{8}{11}b \right) \)

Use the Addition property of equations to solve each equation. Include a check of your solution.

47. \( x + 8 = -5 \)  
48. \( v + (-7) = -16 \)

49. \( b + (-9) = -2 \)  
50. \( y - (-6) = -3 \)

Use the Multiplication property of equations to solve each equation. Include a check of your solution.

51. \(-8x = -72 \)  
52. \( 6t = -40 \)

53. \( \frac{y}{3} = -13 \)  
54. \( -\frac{3}{4}a = -\frac{9}{16} \)

Solve each equation. Include a check of your solution.

55. \( 3x - 4 = -16 \)  
56. \( 5a - 4 = -29 \)

57. \(-4t + 1 = -23 \)  
58. \( -\frac{2}{3}y - 5 = -9 \)

59. \( \frac{a}{-4} - 5 = -2 \)  
60. \( \frac{b}{-4} + 2 = -7 \)
Solve each equation by first eliminating fractions. Include a check of your solution.

61. \( \frac{1}{3}x - 2 = -5 \)

62. \( -\frac{1}{4}y + 3 = \frac{1}{2} \)

63. \( -\frac{1}{4}a + \frac{2}{3} = -\frac{1}{2} \)

64. \( -\frac{7}{12}b + \frac{1}{4} = -\frac{5}{6} \)

Solve the following equations. State if there is no solution or any number solution. Include a check of your solution.

65. \( 6x - 3 = 7x + 2 \)

66. \( -6y + 1 = -3y - 5 \)

67. \( -9s + 10 = -2 - 5s \)

68. \( 4t + 3 = 6t - 5 \)

Solve each equation by first eliminating fractions and/or decimals. Include a check of your solution.

69. \( \frac{1}{6}x + \frac{1}{3} = x - \frac{1}{2} \)

70. \( \frac{1}{3}t + \frac{3}{4} = \frac{1}{6}t - \frac{1}{2} \)

71. \( \frac{7}{12}s - \frac{1}{3} = \frac{3}{4}s + \frac{5}{6} \)

72. \( -1.7y - 3.5 = -1.9y - 4.9 \)

Solve the following equations. State if there is no solution or any number solution. Include a check of your solution.

73. \( 5(x - 1) = 3(2x - 4) \)

74. \( -\frac{1}{4}(2y - 1) = -\frac{1}{3}(6y - 2) \)

75. \( 7(s - 1) - 6(s - 2) = -4 \)

76. \( 4(3t - 5) - 6(2t - 3) = -6 \)

77. \( -\frac{1}{6}(u - 2) - \frac{1}{2}(u + 2) = -\frac{2}{3} \)

78. \( -5(5v - 2) + 2(3v - 1) = -4(4v - 3) \)
Solve each of the following application problems. Use the steps for solving application problems.

79. One number is three less than twice another. The sum of the two numbers is 33. Find the two numbers.
80. The sum of three times a number and $-5$ is $-41$. Find the number.
81. A 5 foot board is cut so that one piece is $1\frac{1}{2}$ times the length of the other piece. Find the length of each piece.
82. The length of a rectangle is 3 meters less than twice the width. If the perimeter is 84 meters, find the length and width.
83. The length and width of a rectangle are two consecutive odd integers. If the perimeter is 192 inches, find the length and width.
84. One angle in a triangle is $46^\circ$, and the other two angles are equal in measure. Find the measure of the other two angles.
85. Jenny is four years older than Frank. One year ago Jenny was twice as old as Frank. How old are each of them now?
86. In four years Travis will be twice as old as he was four years ago. How old is Travis now?
87. A school sells 300 tickets for a local play, consisting of $5$ tickets for adults and $4$ tickets for students. If a total of $1380$ is collected for the tickets, how many of each type of ticket is sold?
88. Tickets for a 10,000 seat Roger Waters concert are sold for $60$ and $75$. If the concert is sold out and a total of $645,000$ is collected, how many of each type of ticket are sold?
89. Martha has nickels and quarters in her purse. She has twice as many nickels as quarters, and $4.20$ total in her purse. How many of each type of coin does she have?
90. Mark has $310$ in gambling chips. He has twice as many $5$ chips as $1$ chips, and the same amount of $10$ chips as $5$ chips. How many of each type of chip does he have?