

**Chapter Three Review****Section 3.1 Variables and Algebraic Expressions**

- |  |                                     |
|--|-------------------------------------|
| 1. Brandon is closer by 250 miles.                       | 2. $h + 7$                          |
| 3. $n - 5$   | 4. $7x$                             |
| 5. $\frac{6}{p}$   | 6. $s + (-15)$                      |
| 7. $2l$  | 8. $D - 100$                        |
| 9. $r + 2$   | 10. $\frac{45}{x}$                  |
| 11. $\frac{c}{6}$ children in each room                  | 12. $\$(1000 - x)$                  |
| 13. $x =$ hours wife drove<br>$2x =$ hours husband drove | 14. $w =$ width<br>$w + 3 =$ length |
| 15. $12x$  | 16. $\frac{d}{7}$                   |

**Section 3.2 Evaluating Algebraic Expressions and Formulas**

- |                       |                                    |
|-----------------------|------------------------------------|
| 17. RETAINING WALLS   | 18. upper base = $10 - 5 = 5$ feet |
| $h =$ height of wall  | lower base = $2(10) - 3$           |
| $h - 5 =$ upper base  | $= 20 - 3$                         |
| $2h - 3 =$ lower base | $= 17$ feet                        |

$$\begin{aligned}
 19. \quad & -2x+6 \text{ for } x=-3 \\
 & -2(-3)+6=6+6 \\
 & =12
 \end{aligned}$$

$$\begin{aligned}
 20. \quad & \frac{6-a}{1+a} \text{ for } a=-2 \\
 & \frac{6-(-2)}{1+(-2)} = \frac{6+2}{-1} \\
 & = \frac{8}{-1} \\
 & = -8
 \end{aligned}$$

$$\begin{aligned}
 21. \quad & b^2 - 4ac \text{ for } a=4, b=6, \text{ and } c=-4 \\
 & (6)^2 - 4(4)(-4) = 36 - 4(4)(-4) \\
 & = 36 - 16(-4) \\
 & = 36 - (-64) \\
 & = 36 + 64 \\
 & = 100
 \end{aligned}$$

$$\begin{aligned}
 22. \quad & \frac{-2k^3}{1-2-3} \text{ for } k=-2 \\
 & \frac{-2(-2)^3}{1-2-3} = \frac{-2(-8)}{1+(-2)+(-3)} \\
 & = \frac{16}{-1+(-3)} \\
 & = \frac{16}{-4} \\
 & = -4
 \end{aligned}$$

## 23. DISTANCE TRAVELED

	Rate (mph)	Time (hr)	Distance Traveled (mi)
Monorail	65	2	130
Subway	38	3	114
Train	$x$	6	$6x$
Bus	55	$t$	$55t$

## 24. SALE PRICE

$$\begin{aligned}
 s &= p - d \\
 s &= 315 - 37 \\
 s &= 278
 \end{aligned}$$

The sale price is \$278.

## 25. RETAIL PRICE

$$\begin{aligned}
 r &= p + m \\
 r &= 14,505 + 725 \\
 r &= 15,230
 \end{aligned}$$

The retail price is \$15,230.

26. 1998

27. Remember;  $p = r - c$ , 2000

28. The costs decreased.

29. TEMPERATURE CONVERSION

$$C = \frac{5(F - 32)}{9} \text{ for } F = 77$$

$$C = \frac{5(77 - 32)}{9}$$

$$C = \frac{5(45)}{9}$$

$$C = \frac{225}{9}$$

$$C = 25$$

The pool is  $2^{\circ}\text{C}$  warmer.

30. DISTANCE FALLEN

$$d = 16t^2 \text{ for } t = 3$$

$$d = 16(3)^2$$

$$d = 16(9)$$

$$d = 144$$

The hammer falls 144 feet.

31. AVERAGE YEARS OF EXPERIENCE

Must realize there are 2 grandparents, 2 parents, and 1 grandson.

$$M = \frac{40 + 40 + 18 + 18 + 4}{5}$$

$$M = \frac{120}{5}$$

$$M = 24$$

The average number of years is 24 years.

**Section 3.3 Simplifying Algebraic Expressions and the Distributive Property**

32.  $-2(5x) = -10x$

33.  $-7(-6y) = 42xy$

34.  $4d \cdot 3e \cdot 5 = 60de$

35.  $(4s)8 = 32s$

36.  $-1(-e)(2) = 2e$

37.  $7x \cdot 7y = 49xy$

38.  $4 \cdot 3k \cdot 7 = 84k$

39.  $(-10t)(-10) = 100t$

40.  $4(y+5) = 4y+20$

41.  $-5(6t+9) = -30t-45$

42.  $(-3-3x)7 = -21-21x$

43.  $-3(4e-8x-1) = -12e+24x+3$

44.  $-(6t-4) = -6t+4$

45.  $-(5+x) = -5-x$

46.  $-(6t-3s+1) = -6t+3s-1$

47.  $-(-5a-3) = 5a+3$

**Section 3.4 Combining Like Terms**

48.  $-4x, 8$

49.  $-3y, 1$

50. factor

51. term

52. factor

53. term

54. yes

55. no

56. yes

57. no

58.  $3x+4x = 7x$

59.  $-3t-6t = -3t+(-6t)$   
 $= -9t$

60.  $2z+(-5z) = -3z$

61.  $6x-x = 5x$

62.  $-6y-7y-(-y) = -6y+(-7y)+y$   
 $= -13y+y$   
 $= -12y$

63.  $5w-8-4w+3 = w-5$

$$64. \quad -45d - 2a + 4a - d = 2a - 45d + (-d) \\ = 2a - 46d$$

$$65. \quad 5y + 8h - 3 + 7h + 5y + 2 = 15h + 10y - 1$$

$$66. \quad 7(y + 6) + 3(2y + 2) = 7y + 42 + 6y + 6 \\ = 13y + 48$$

$$67. \quad -4(t - 7) - (t + 6) = -4t + 28 - t - 6 \\ = -4t + (-t) + 22 \\ = -5t + 22$$

$$68. \quad 5x - 2(x - 6) = 5x - 2x + 12 \\ = 3x + 12$$

$$69. \quad 6f + 7(12 - 8f) = 6f + 84 - 56f \\ = 6f + (-56f) + 84 \\ = -50f + 84$$

$$70. \quad 0 - 14m = -14m$$

$$71. \quad 0 + 14m = 14m$$

## 72. HOLIDAY LIGHTS

$P_h$  = perimeter of house

$$P_h = 35 + 42 + 35 + 42$$

$$P_h = 154 \text{ feet}$$

$P_w$  = perimeter of window

$$P_w = 5 + 5 + 5 + 5$$

$$P_w = 20 \text{ feet}$$

$P_t$  = total feet of lights needed

$$P_t = P_h + 2P_w$$

$$P_t = 154 + 2(20)$$

$$P_t = 154 + 40$$

$$P_t = 194 \text{ feet}$$

194 feet of lights are needed.

40.  $4(y+5) = 4y + 20$

41.  $-5(6t+9) = -30t - 45$

42.  $(-3-3x)7 = -21 - 21x$

43.  $-3(4e-8x-1) = -12e + 24x + 3$

44.  $-(6t-4) = -6t + 4$

45.  $-(5+x) = -5 - x$

46.  $-(6t-3s+1) = -6t + 3s - 1$

47.  $-(-5a-3) = 5a + 3$

**Section 3.4 Combining Like Terms**

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58.  $3x + 4x = 7x$

59.  $-3t - 6t = -3t + (-6t)$   
 $= -9t$

60.  $2z + (-5z) = -3z$

61.  $6x - x = 5x$

62.  $-6y - 7y - (-y) = -6y + (-7y) + y$   
 $= -13y + y$   
 $= -12y$

63.  $5w - 8 - 4w + 3 = w - 5$

## Section 3.5 Simplifying Expressions to Solve Equations

73.  $-4x + 6 = 2(x + 12)$  for  $x = -3$

$$-4(-3) + 6 = 2(-3 + 12)$$

$$12 + 6 = 2(9)$$

$$18 = 18$$

Yes,  $-3$  is a solution because it makes a true statement when substituted into the equation.

74.  $5a - 3a = -36$

$$2a = -36$$

$$\frac{2a}{2} = \frac{-36}{2}$$

$$a = -18$$

Check:

$$5(-18) - 3(-18) = -36$$

$$-90 - (-54) = -36$$

$$-90 + 54 = -36$$

$$-36 = -36$$

75.  $3x - 4x = -8$

$$3x + (-4x) = -8$$

$$-x = -8$$

$$\frac{-x}{-1} = \frac{-8}{-1}$$

$$x = 8$$

Check:

$$3(8) - 4(8) = -8$$

$$24 - 32 = -8$$

$$24 + (-32) = -8$$

$$-8 = -8$$

76.  $7x = 3x - 12$

$$7x - 3x = 3x - 12 - 3x$$

$$4x = -12$$

$$\frac{4x}{4} = \frac{-12}{4}$$

$$x = -3$$

Check:

$$7(-3) = 3(-3) - 12$$

$$-21 = -9 - 12$$

$$-21 = -9 + (-12)$$

$$-21 = -21$$

77.  $5(y - 15) = 0$

$$5y - 75 = 0$$

$$5y - 75 + 75 = 0 + 75$$

$$5y = 75$$

$$\frac{5y}{5} = \frac{75}{5}$$

$$y = 15$$

Check:

$$5(15 - 15) = 0$$

$$5(0) = 0$$

$$0 = 0$$

78.  $3a - (2a - 1) = -2$

$3a - 2a + 1 = -2$

$a + 1 = -2$

$a + 1 - 1 = -2 - 1$

$a = -2 + (-1)$

$a = -3$

Check:

$3(-3) - (2[-3] - 1) = -2$

$-9 - (-6 - 1) = -2$

$-9 - (-6 + [-1]) = -2$

$-9 - (-7) = -2$

$-9 + 7 = -2$

$-2 = -2$

80.  $-6(2x + 3) = -(5x - 3)$

$-12x - 18 = -5x + 3$

$-12x - 18 + 12x = -5x + 3 + 12x$

$-18 = 7x + 3$

$-18 - 3 = 7x + 3 - 3$

$-18 + (-3) = 7x$

$-21 = 7x$

$\frac{-21}{7} = \frac{7x}{7}$

$-3 = x \text{ or } x = -3$

Check:

$-6(2[-3] + 3) = -(5[-3] - 3)$

$-6(-6 + 3) = -(-15 - 3)$

$-6(-3) = -(-15 + [-3])$

$18 = -(-18)$

$18 = 18$

79.  $15 = 5b + 1 + 2b$

$15 = 7b + 1$

$15 - 1 = 7b + 1 - 1$

$14 = 7b$

$\frac{14}{7} = \frac{7b}{7}$

$2 = b \text{ or } b = 2$

Check:

$15 = 5(2) + 1 + 2(2)$

$15 = 10 + 1 + 4$

$15 = 15$

81.  $4 + 3(2x + 4) - 4 = -42$

$4 + 6x + 12 - 4 = -42$

$6x + 12 = -42$

$6x + 12 - 12 = -42 - 12$

$6x = -42 + (-12)$

$6x = -54$

$\frac{6x}{6} = \frac{-54}{6}$

$x = -9$

Check:

$4 + 3(2[-9] + 4) - 4 = -42$

$4 + 3(-18 + 4) - 4 = -42$

$4 + 3(-14) - 4 = -42$

$4 + (-42) - 4 = -42$

$-38 + (-4) = -42$

$-42 = -42$

## Section 3.6 Problem Solving

82. Type of coin	Number	Value (¢)	Total value (¢)
Dime	6	10	60
Quarter	7	25	175
Penny	$x$	1	$x$
Nickel	$n$	5	$5n$

83. REFRESHMENTS

 $56 - c$  cups left.

84. COLD STORAGE

 $h$  = hours needed to drop temp

$$7h = 71 - 29$$

$$7h = 42$$

$$\frac{7h}{7} = \frac{42}{7}$$

$$h = 6$$

It takes 6 hours.

85. FITNESS

 $d$  = distance she bikes $d - 8$  = distance she jogs

$$d + d - 8 = 18$$

$$2d - 8 = 18$$

$$2d - 8 + 8 = 18 + 8$$

$$2d = 26$$

$$\frac{2d}{2} = \frac{26}{2}$$

$$d = 13$$

She bikes 13 miles.

86. CAR SHOWS

 $x$  = first day attendance $2x$  = second day attendance

$$x + 2x = 6,600$$

$$3x = 6,600$$

$$\frac{3x}{3} = \frac{6,600}{3}$$

$$x = 2,200$$

2,200 people attended the first day.

## 87. HEALTH FOOD

	Number of drinks sold	Cost of drink (\$)	Total receipts (\$)
\$3 drinks	$x$	3	$3x$
\$4 drinks	$50 - x$	4	$4(50 - x)$
Total	50		185

$$3x + 4(50 - x) = 185$$

$$3x + 200 - 4x = 185$$

$$3x + 200 + (-4x) = 185$$

$$-x + 200 = 185$$

$$-x + 200 - 200 = 185 - 200$$

$$-x = 185 + (-200)$$

$$-x = -15$$

$$\frac{-x}{-1} = \frac{-15}{-1}$$

$$x = 15$$

There were 15 \$3 drinks sold and  $50 - 15 = 35$  \$4 drinks were sold.