

95.  $|3x + 2| < 4$

 Keystrokes:  $\boxed{Y=}$   $\boxed{ABS}$   $\boxed{(}$   $\boxed{3}$   $\boxed{X,T,\theta}$   $\boxed{+}$   $\boxed{2}$   $\boxed{)}$   $\boxed{<}$   $\boxed{4}$   $\boxed{GRAPH}$ 

$$-2 < x < \frac{2}{3}$$

97.  $|2x + 3| > 9$

 Keystrokes:  $\boxed{Y=}$   $\boxed{ABS}$   $\boxed{(}$   $\boxed{2}$   $\boxed{X,T,\theta}$   $\boxed{+}$   $\boxed{3}$   $\boxed{)}$   $\boxed{>}$   $\boxed{9}$   $\boxed{GRAPH}$ 

$$x < -6 \text{ or } x > 3$$

99.  $|x - 5| + 3 \leq 5$

 Keystrokes:  $\boxed{Y=}$   $\boxed{ABS}$   $\boxed{(}$   $\boxed{X,T,\theta}$   $\boxed{-}$   $\boxed{5}$   $\boxed{)}$   $\boxed{+}$   $\boxed{3}$   $\boxed{\leq}$   $\boxed{5}$   $\boxed{GRAPH}$ 

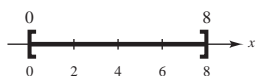
$$3 \leq x \leq 7$$

101. Matches graph (d).

$$|x - 4| \leq 4$$

$$-4 \leq x - 4 \leq 4$$

$$0 \leq x \leq 8$$



103. Matches graph (b).

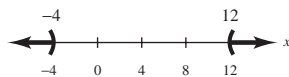
$$\frac{1}{2}|x - 4| > 4$$

$$|x - 4| > 8$$

$$x - 4 > 8 \quad \text{or} \quad x - 4 < -8$$

$$x > 12$$

$$x < -4$$


 105.  $[-2, 2]$ 

$$|x| \leq 2$$

107. (16, 22)

$$16 < x < 22$$

$$-3 < x - 19 < 3$$

$$|x - 19| < 3$$

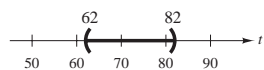
 109.  $|x| < 3$ 

 111.  $|x - 5| > 6$ 

 113.  $|t - 72| < 10$ 

$$-10 < t - 72 < 10$$

$$62 < t < 82$$


 115. (a)  $|s - x| \leq \frac{3}{16}$ 

 (b)  $\left|5\frac{1}{8} - x\right| \leq \frac{3}{16}$ 

$$-\frac{3}{16} \leq 5\frac{1}{8} - x \leq \frac{3}{16}$$

$$-\frac{3}{16} \leq \frac{41}{8} - x \leq \frac{3}{16}$$

$$-\frac{85}{16} \leq -x \leq -\frac{79}{16}$$

$$\frac{85}{16} \geq x \geq \frac{79}{16}$$

117. The absolute value of a real number measures the distance of the real number from zero.

 119. The solutions of  $|x| = a$  are  $x = a$  and  $x = -a$ . For example, to solve  $|x - 3| = 5$ :

$$x - 3 = 5 \quad \text{or} \quad x - 3 = -5$$

$$x = 8 \quad \quad \quad x = -2$$

 121. The graph of  $|x - 4| < 1$  can be described as all real numbers less than one unit from 4.

 123.  $|x - 3| \leq 3$  since

$$-3 \leq x - 3 \leq 3$$

$$0 \leq x \leq 6.$$

## Review Exercises for Chapter 1

1. (a)  $45 - 7(3) = 3$

$$45 - 21 = 3$$

$$24 = 3$$

Not a solution

(b)  $45 - 7(6) = 3$

$$45 - 42 = 3$$

$$3 = 3$$

Solution

$$3. \text{ (a) } \frac{35}{12} + \frac{35}{12} = 1$$

$$\frac{5}{12} + \frac{7}{12} = 1$$

$$\frac{12}{12} = 1$$

$$1 = 1$$

Solution

$$\text{(b) } \frac{-\frac{2}{35}}{7} + \frac{-\frac{2}{35}}{5} = 1$$

$$-\frac{2}{245} + -\frac{2}{175} = 1$$

$$-\frac{10}{1225} + -\frac{14}{1225} = 1$$

$$-\frac{24}{1225} = 1$$

Not a solution

$$5. \quad x + 2 = 5$$

$$x + 2 - 2 = 5 - 2$$

$$x = 3$$

**Check:**

$$3 + 2 \stackrel{?}{=} 5$$

$$5 = 5$$

$$7. \quad -3x = 36$$

$$\frac{-3x}{-3} = \frac{36}{-3}$$

$$x = -12$$

**Check:**

$$-3(-12) \stackrel{?}{=} 36$$

$$36 = 36$$

$$9. \quad -\frac{1}{8}x = 3$$

$$(-8)\left(-\frac{1}{8}x\right) = (3)(-8)$$

$$x = -24$$

**Check:**

$$-\frac{1}{8}(-24) \stackrel{?}{=} 3$$

$$3 = 3$$

$$11. \quad 5x + 4 = 19$$

$$5x + 4 - 4 = 19 - 4$$

$$5x = 15$$

$$\frac{5x}{5} = \frac{15}{5}$$

$$x = 3$$

**Check:**

$$5(3) + 4 \stackrel{?}{=} 19$$

$$15 + 4 \stackrel{?}{=} 19$$

$$19 = 19$$

$$13. \quad 17 - 7x = 3$$

$$17 - 7x - 17 = 3 - 17$$

$$-7x = -14$$

$$\frac{-7x}{-7} = \frac{-14}{-7}$$

$$x = 2$$

**Check:**

$$17 - 7(2) \stackrel{?}{=} 3$$

$$17 - 14 \stackrel{?}{=} 3$$

$$3 = 3$$

$$15. \quad 7x - 5 = 3x + 11$$

$$7x - 3x - 5 = 3x - 3x + 11$$

$$4x - 5 = 11$$

$$4x - 5 + 5 = 11 + 5$$

$$4x = 16$$

$$\frac{4x}{4} = \frac{16}{4}$$

$$x = 4$$

**Check:**

$$7(4) - 5 \stackrel{?}{=} 3(4) + 11$$

$$28 - 5 \stackrel{?}{=} 12 + 11$$

$$23 = 23$$

$$17. \quad 3(2y - 1) = 9 + 3y$$

$$6y - 3 = 9 + 3y$$

$$6y - 3y - 3 = 9 + 3y - 3y$$

$$3y - 3 = 9$$

$$3y - 3 + 3 = 9 + 3$$

$$3y = 12$$

$$\frac{3y}{3} = \frac{12}{3}$$

$$y = 4$$

**Check:**

$$3(2(4) - 1) \stackrel{?}{=} 9 + 3(4)$$

$$3(7) \stackrel{?}{=} 9 + 12$$

$$21 = 21$$

19.  $4y - 6(y - 5) = 2$

$4y - 6y + 30 = 2$

$-2y + 30 = 2$

$-2y + 30 - 30 = 2 - 30$

$-2y = -28$

$\frac{-2y}{-2} = \frac{-28}{-2}$

$y = 14$

**Check:**

$4(14) - 6(14 - 5) \stackrel{?}{=} 2$

$56 - 6(9) \stackrel{?}{=} 2$

$56 - 54 \stackrel{?}{=} 2$

$2 = 2$

21.  $4(3x - 5) = 6(2x + 3)$

$12x - 20 = 12x + 18$

$12x - 12x - 20 = 12x - 12x + 18$

$-20 = 18$

No solution

23.  $\frac{4}{5}x - \frac{1}{10} = \frac{3}{2}$

$10\left[\frac{4}{5}x - \frac{1}{10}\right] = \left[\frac{3}{2}\right]10$

$8x - 1 = 15$

$8x - 1 + 1 = 15 + 1$

$8x = 16$

$\frac{8x}{8} = \frac{16}{8}$

$x = 2$

**Check:**

$\frac{4}{5}(2) - \frac{1}{10} \stackrel{?}{=} \frac{3}{2}$

$\frac{8}{5} - \frac{1}{10} \stackrel{?}{=} \frac{3}{2}$

$\frac{16}{10} - \frac{1}{10} \stackrel{?}{=} \frac{3}{2}$

$\frac{15}{10} \stackrel{?}{=} \frac{3}{2}$

$\frac{3}{2} = \frac{3}{2}$

25.  $1.4t + 2.1 = 0.9t$

$1.4t + 2.1 - 0.9t = 0.9t - 0.9t$

$0.5t + 2.1 = 0$

$0.5t + 2.1 - 2.1 = 0 - 2.1$

$0.5t = -2.1$

$\frac{0.5t}{0.5} = \frac{-2.1}{0.5}$

$t = -4.2$

**Check:**

$1.4(-4.2) + 2.1 \stackrel{?}{=} 0.9(-4.2)$

$-5.88 + 2.1 \stackrel{?}{=} -3.78$

$-3.78 = -3.78$

27.

Percent	Parts out of 100	Decimal	Fraction
87%	87	0.87	$\frac{87}{100}$

29. Verbal Model:

Compared number	=	Percent	·	Base number
-----------------	---	---------	---	-------------

Labels:

Compared number =  $a$

Percent =  $p$

Base number =  $b$

Equation:  $a = p \cdot b$ 

$a = 1.30 \cdot 50$

$a = 65$

31. Verbal Model:  $\boxed{\text{Compared number}} = \boxed{\text{Percent}} \cdot \boxed{\text{Base number}}$

Labels: Compared number =  $a$   
 Percent =  $p$   
 Base number =  $b$

Equation:  $a = p \cdot b$   
 $645 = 0.215 \cdot b$   
 $\frac{645}{0.215} = b$   
 $3000 = b$

33. Verbal Model:  $\boxed{\text{Compared number}} = \boxed{\text{Percent}} \cdot \boxed{\text{Base number}}$

Labels: Compared number =  $a$   
 Percent =  $p$   
 Base number =  $b$

Equation:  $a = p \cdot b$   
 $250 = p \cdot 200$   
 $\frac{250}{200} = p$   
 $1.25 = p$  or 125%

35.  $\frac{16 \text{ feet}}{4 \text{ yards}} = \frac{16 \text{ feet}}{12 \text{ feet}} = \frac{16}{12} = \frac{4}{3}$

39.  $\frac{7}{8} = \frac{y}{4}$

$8y = 28$

$y = \frac{28}{8}$

$y = \frac{7}{2}$

37.  $\frac{45 \text{ seconds}}{5 \text{ minutes}} = \frac{45 \text{ seconds}}{300 \text{ seconds}} = \frac{45}{300} = \frac{3}{20}$

41.  $\frac{b}{6} = \frac{5 + b}{15}$

$15b = 6(5 + b)$

$15b = 30 + 6b$

$9b = 30$

$b = \frac{30}{9}$

$b = \frac{10}{3}$

43. Verbal Model:  $\boxed{\text{Selling price}} = \boxed{\text{Cost}} + \boxed{\text{Markup}}$

Labels: Selling price = 149.93  
 Cost = 99.95  
 Markup =  $x$

Equation:  $149.93 = 99.95 + x$   
 $149.93 - 99.95 = x$   
 $\$49.98 = x$

Verbal Model:  $\boxed{\text{Markup}} = \boxed{\text{Markup rate}} \cdot \boxed{\text{Cost}}$

Labels: Markup = 49.98  
 Markup rate =  $x$   
 Cost = 99.95

Equation:  $49.98 = x \cdot 99.95$   
 $\frac{49.98}{99.95} = x$   
 $50\% \approx x$

45. Verbal Model:  $\boxed{\text{Selling price}} = \boxed{\text{Cost}} + \boxed{\text{Markup}}$

Labels: Selling price = 125.85  
 Cost =  $x$   
 Markup = 44.13

Equation:  $125.85 = x + 44.13$   
 $125.85 - 44.13 = x$   
 $\$81.72 = x$

Verbal Model:  $\boxed{\text{Markup}} = \boxed{\text{Markup rate}} \cdot \boxed{\text{Cost}}$

Labels: Markup = 44.13  
 Markup rate =  $x$   
 Cost = 81.72

Equation:  $44.13 = x \cdot 81.72$   
 $\frac{44.13}{81.72} = x$   
 $54\% \approx x$

47. Verbal Model:  $\boxed{\text{Sale price}} = \boxed{\text{List price}} - \boxed{\text{Discount}}$

Labels: Sale price = 53.96

List price = 71.95

Discount =  $x$

Equation:  $53.96 = 71.95 - x$

$$x = 71.95 - 53.96$$

$$x = \$17.99$$

Verbal Model:  $\boxed{\text{Discount}} = \boxed{\text{Discount rate}} \cdot \boxed{\text{List price}}$

Labels: Discount = 17.99

Discount rate =  $x$

List price = 71.95

Equation:  $17.99 = x \cdot 71.95$

$$\frac{17.99}{71.95} = x$$

$$25\% \approx x$$

49. Verbal Model:  $\boxed{\text{Sale price}} = \boxed{\text{List price}} - \boxed{\text{Discount}}$

Labels: Sale price =  $x$

List price = 1995.50

Discount = 598.65

Equation:  $x = 1995.50 - 598.65$

$$x = \$1396.85$$

Verbal Model:  $\boxed{\text{Discount}} = \boxed{\text{Discount rate}} \cdot \boxed{\text{List price}}$

Labels: Discount = 598.65

Discount rate =  $x$

List price = 1995.50

Equation:  $598.65 = x \cdot 1995.50$

$$\frac{598.65}{1995.50} = x$$

$$30\% = x$$

51.  $2x - 7y + 4 = 0$

$$2x = 7y - 4$$

$$x = \frac{7}{2}y - 2$$

$$x = \frac{1}{2}(7y - 4)$$

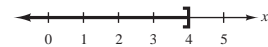
53.  $V = \pi r^2 h$

$$\frac{V}{\pi r^2} = h$$

55.  $x - 5 \leq -1$

$$x - 5 + 5 \leq -1 + 5$$

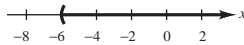
$$x \leq 4$$



57.  $-5x < 30$

$$\frac{-5x}{-5} > \frac{30}{-5}$$

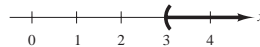
$$x > -6$$



59.  $5x + 3 > 18$

$$5x > 15$$

$$x > 3$$



61.  $8x + 1 \geq 10x - 11$

$$8x - 10x + 1 \geq 10x - 10x - 11$$

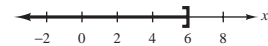
$$-2x + 1 \geq -11$$

$$-2x + 1 - 1 \geq -11 - 1$$

$$-2x \geq -12$$

$$\frac{-2x}{-2} \leq \frac{-12}{-2}$$

$$x \leq 6$$

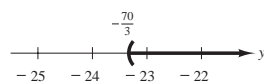


63.  $\frac{1}{3} - \frac{1}{2}y < 12$

$$2 - 3y < 72$$

$$-3y < 70$$

$$y > -\frac{70}{3}$$



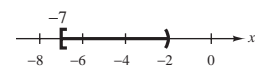
65.  $-6 \leq 2x + 8 < 4$

$$-6 - 8 \leq 2x + 8 - 8 < 4 - 8$$

$$-14 \leq 2x < -4$$

$$\frac{-14}{2} \leq \frac{2x}{2} < \frac{-4}{2}$$

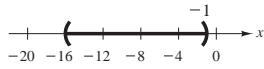
$$-7 \leq x < -2$$



$$67. \quad 5 > \frac{x+1}{-3} > 0$$

$$-15 < x + 1 < 0$$

$$-16 < x < -1$$



$$71. \quad -4(3 - 2x) \leq 3(2x - 6)$$

$$-12 + 8x \leq 6x - 18$$

$$-12 + 8x - 6x \leq 6x - 6x - 18$$

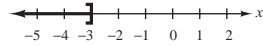
$$-12 + 2x \leq -18$$

$$-12 + 12 + 2x \leq -18 + 12$$

$$2x \leq -6$$

$$\frac{2x}{2} \leq \frac{-6}{2}$$

$$x \leq -3$$



$$73. \quad z \leq 10$$

$$75. \quad 7 \leq y < 14$$

$$77. \quad |x| = 6$$

$$x = 6 \text{ or } x = -6$$

$$79. \quad |4 - 3x| = 8$$

$$4 - 3x = 8 \quad \text{or} \quad 4 - 3x = -8$$

$$4 - 4 - 3x = 8 - 4 \quad 4 - 4 - 3x = -8 - 4$$

$$-3x = 4 \quad -3x = -12$$

$$\frac{-3x}{-3} = \frac{4}{-3} \quad \frac{-3x}{-3} = \frac{-12}{-3}$$

$$x = \frac{4}{-3} \quad x = 4$$

$$81. \quad |5x + 4| - 10 = -6$$

$$|5x + 4| = 4$$

$$5x + 4 = 4 \quad \text{or} \quad 5x + 4 = -4$$

$$5x + 4 - 4 = 4 - 4 \quad 5x + 4 - 4 = -4 - 4$$

$$5x = 0 \quad 5x = -8$$

$$\frac{5x}{5} = \frac{0}{5} \quad \frac{5x}{5} = \frac{-8}{5}$$

$$x = 0 \quad x = -\frac{8}{5}$$

$$83. \quad |3x - 4| = |x + 2|$$

$$3x - 4 = x + 2 \quad \text{or} \quad 3x - 4 = -(x + 2)$$

$$2x = 6 \quad 3x - 4 = -x - 2$$

$$x = 3 \quad 4x = 2$$

$$x = \frac{2}{4} = \frac{1}{2}$$

$$85. \quad |x - 4| > 3$$

$$x - 4 < -3 \quad \text{or} \quad x - 4 > 3$$

$$x < 1 \quad \text{or} \quad x > 7$$

$$87. \quad |3x| > 9$$

$$3x < -9 \quad \text{or} \quad 3x > 9$$

$$x < -3 \quad \text{or} \quad x > 3$$

$$89. \quad |2x - 7| < 15$$

$$-15 < 2x - 7 < 15$$

$$-8 < 2x < 22$$

$$-4 < x < 11$$

$$69. \quad 5x - 4 < 6 \quad \text{and} \quad 3x + 1 > -8$$

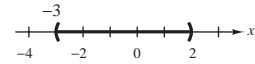
$$5x - 4 + 4 < 6 + 4 \quad 3x + 1 - 1 > -8 - 1$$

$$5x < 10 \quad 3x > -9$$

$$\frac{5x}{5} < \frac{10}{5} \quad \frac{3x}{3} > \frac{-9}{3}$$

$$x < 2 \quad \text{and} \quad x > -3$$

$$-3 < x < 2$$



91.  $|b + 2| - 6 > 1$

$|b + 2| > 7$

$b + 2 < -7$  or  $b + 2 > 7$

$b < -9$  or  $b > 5$

93.  $|2x - 5| \geq 1$

Keystrokes:  $\boxed{Y=}$   $\boxed{ABS}$   $\boxed{(}$   $\boxed{2}$   $\boxed{X,T,\theta}$   $\boxed{-}$   $\boxed{5}$   $\boxed{)}$   $\boxed{\geq}$   $\boxed{1}$   $\boxed{GRAPH}$ 

$x \leq 2$  or  $x \geq 3$

95. (1, 5)

$1 < x < 5$

$1 - 3 < x - 3 < 5 - 3$

$-2 < x - 3 < 2$

$|x - 3| < 2$

97. Verbal Model:  $\boxed{\text{First integer}} + \boxed{\text{Second integer}} = \boxed{\text{Sum}}$

Labels: First integer =  $x$

Second integer =  $x + 1$

Sum = 147

Equation:  $x + (x + 1) = 147$

$2x + 1 = 147$

$2x + 1 - 1 = 147 - 1$

$2x = 146$

$\frac{2x}{2} = \frac{146}{2}$

$x = 73, x + 1 = 74$

99. Verbal Model:  $\boxed{\text{Commission}} = \boxed{\text{Percent rate}} \cdot \boxed{\text{Sales}}$

Labels: Commission = 9000

Percent rate =  $x$

Sales = 150,000

Equation:  $9000 = x \cdot 150,000$

$\frac{9000}{150,000} = x$

$6\% = x$

101. Verbal Model:  $\boxed{\text{Total price}} = \boxed{\text{List price}} + \boxed{\text{Shipping}}$

Labels: Total price =  $x$

List price = 24.95

Shipping = 6.95

Equation:  $x = 24.95 + 6.95$

$x = \$31.90$

Verbal Model:  $\boxed{\text{Discount}} = \boxed{\text{Discount rate}} \cdot \boxed{\text{List price}}$

Labels: Discount =  $x$

Discount rate = 30%

List price = 35.95

Equation:  $x = 0.30 \cdot 35.95$

$x = \$10.79$

—CONTINUED—

## 101. —CONTINUED—

Verbal Model:  $\boxed{\text{Sale price}} = \boxed{\text{List price}} - \boxed{\text{Discount}}$

Labels: Sale price =  $x$   
List price = \$35.95  
Discount = \$10.79

Equation:  $x = 35.95 - 10.79$   
 $x = \$25.16$

The department store price is the better buy.

103. Verbal Model:  $\boxed{\text{Sales tax}} = \boxed{\text{Percent rate}} \cdot \boxed{\text{Cost}}$

Labels: Sales tax =  $x$   
Percent rate =  $7\frac{1}{4}\%$   
Cost = 34

Equation:  $x = 0.0725 \cdot 34$   
 $x = \$2.47$

107. Verbal Model:  $\frac{\boxed{\text{Gasoline}}}{\boxed{\text{Oil}}} = \frac{\boxed{\text{Gasoline}}}{\boxed{\text{Oil}}}$

Proportion:  $\frac{50}{1} = \frac{x}{\frac{1}{2}}$   
 $x = 25$  pints

111. Verbal Model:  $\frac{\boxed{\text{Silo's height}}}{\boxed{\text{Silo's shadow}}} = \frac{\boxed{\text{Your height}}}{\boxed{\text{Your shadow}}}$

Proportion:  $\frac{x}{20} = \frac{6}{1\frac{1}{2}}$   
 $x = \frac{120}{1\frac{1}{2}}$   
 $x = 80$  feet

105. Verbal Model:  $\frac{\boxed{\text{Cups}}}{\boxed{\text{Batches}}} = \frac{\boxed{\text{Cups}}}{\boxed{\text{Batches}}}$

Proportion:  $\frac{1\frac{1}{2}}{1} = \frac{x}{2\frac{1}{2}}$   
 $x = 1\frac{1}{2} \cdot 2\frac{1}{2}$   
 $x = 3\frac{3}{4}$  cups

109. Verbal Model:  $\frac{\boxed{\text{Base}}}{\boxed{\text{Side}}} = \frac{\boxed{\text{Base}}}{\boxed{\text{Side}}}$

Proportion:  $\frac{3}{3.5} = \frac{4}{x}$   
 $3x = 14$   
 $x = \frac{14}{3}$

113. Verbal Model:  $\boxed{\text{Increase}} = \boxed{\text{Percent}} \cdot \boxed{\text{Base number}}$

Labels: Increase =  $x$   
Percent =  $5\frac{1}{2}\%$   
Base number = 25,750

Equation:  $x = 0.055 \cdot 25,750$   
 $x = \$1416.25$

Verbal Model:  $\boxed{\text{New model}} = \boxed{\text{Old price}} + \boxed{\text{Increase}}$

Labels: New model =  $x$   
Old price = 25,750  
Increase = 1416.25

Equation:  $x = 25,750 + 1416.25$   
 $x = \$27,166.25$

115. Verbal Model:  $\boxed{\text{Markup}} = \boxed{\text{Selling price}} - \boxed{\text{Cost}}$

Labels: Markup =  $x$   
Selling price = 175.00  
Cost = 95.00

Equation:  $x = 175.00 - 95.00$   
 $x = \$80.00$

Verbal Model:  $\boxed{\text{Markup}} = \boxed{\text{Markup rate}} \cdot \boxed{\text{Cost}}$

Labels: Markup = 80.00  
Markup rate =  $x$   
Cost = 95.00

Equation:  $80.00 = x \cdot 95.00$   
 $\frac{80.00}{95.00} = x$   
 $84.21\% = x$

117. Verbal Model:  $\boxed{\text{Total price}} = \boxed{\text{List price}} + \boxed{\text{Shipping}}$

Labels: Total price =  $x$   
List price = 99.97  
Shipping = 4.50

Equation:  $x = 99.97 + 4.50$   
 $x = \$104.47$

Verbal Model:  $\boxed{\text{Discount}} = \boxed{\text{Discount rate}} \cdot \boxed{\text{List price}}$

Labels: Discount =  $x$   
Discount rate = 20%  
List price = 125.95

Equation:  $x = 0.20 \cdot 125.95$   
 $x = \$25.19$

Verbal Model:  $\boxed{\text{Sale price}} = \boxed{\text{List price}} - \boxed{\text{Discount}}$

Labels: Sale price =  $x$   
List price = 125.95  
Discount = 25.19

Equation:  $x = 125.95 - 25.19$   
 $x = \$100.76$

The department store price is the better buy.

119. Verbal Model:  $\boxed{\text{Amount of solution 1}} + \boxed{\text{Amount of solution 2}} = \boxed{\text{Amount of final solution}}$

Labels: Percent of solution 1 = 30%  
Liters of solution 1 =  $x$   
Percent of solution 2 = 60%  
Liters of solution 2 =  $10 - x$   
Percent of final solution = 50%  
Liters of final solution = 10

Equation:  $0.30x + 0.60(10 - x) = 0.50(10)$   
 $0.30x + 6 - 0.60x = 5$   
 $-0.30x = -1$   
 $x = 3\frac{1}{3}$  liters of 30% solution  
 $10 - x = 6\frac{2}{3}$  liters of 60% solution

121. Verbal Model:  $\boxed{\text{Distance}} = \boxed{\text{Rate}} \cdot \boxed{\text{Time}}$

Labels: Distance =  $d$   
Rate = 1200 mph  
Time =  $2\frac{1}{3}$  hours

Equation:  $d = 1200 \cdot 2\frac{1}{3}$   
 $d = 2800$  miles

123. Verbal Model:  $\boxed{\text{Distance}} = \boxed{\text{Rate}} \cdot \boxed{\text{Time}}$

Labels: Distance = 100 miles  
Rates = 48 mph and 40 mph  
Time =  $t$

Equation:  $d = rt$

$$t = \frac{d}{r}$$

$$t = \frac{100}{48} + \frac{100}{40}$$

$$t = 4.58\bar{3} \text{ or } \frac{55}{12}$$

Verbal Model:  $\boxed{\text{Average speed}} = \boxed{\text{Total distance}} \div \boxed{\text{Total time}}$

Labels: Average speed =  $r$   
Total distance = 200 miles  
Total time =  $4.58\bar{3}$  hours

Equation:  $r = 200 \div 4.58\bar{3}$

$$r \approx 43.6 \text{ mph}$$

127. Verbal Model:  $\boxed{\text{Interest}} = \boxed{\text{Principal}} \cdot \boxed{\text{Rate}} \cdot \boxed{\text{Time}}$

Labels: Interest =  $i$   
Principal = \$1000  
Rate = 8.5%  
Time = 4

Equation:  $i = 1000 \cdot 0.085 \cdot 4$

$$i = \$340$$

131. Verbal Model:  $\boxed{\text{Interest}} = \boxed{\text{Principal}} \cdot \boxed{\text{Rate}} \cdot \boxed{\text{Time}}$

Labels: Interest = 4700  
Principal 1 =  $p$   
Rate 1 = 8.5%  
Principal 2 =  $50,000 - p$   
Rate 2 = 10%  
Time = 1

Equation:  $4700 = 0.085p + 0.10(50,000 - p)$

$$4700 = 0.085p + 5000 - 0.10p$$

$$-300 = -0.015p$$

$$\frac{-300}{-0.015} = p$$

$$\$20,000 = p$$

$$\$30,000 = 50,000 - p$$

125. Verbal Model:  $\boxed{\text{Work done}} = \boxed{\text{Work done by person 1}} + \boxed{\text{Work done by person 2}}$

Labels: Work done = 1  
Rate of person 1 =  $\frac{1}{4.5}$   
Rate of person 2 =  $\frac{1}{6}$

Time =  $t$

Equation:  $1 = \frac{1}{4.5}(t) + \frac{1}{6}(t)$

$$27 = 6t + 4.5t$$

$$27 = 10.5t$$

$$\frac{27}{10.5} = t$$

$$2.57 \text{ hours} = t$$

129. Verbal Model:  $\boxed{\text{Interest}} = \boxed{\text{Principal}} \cdot \boxed{\text{Rate}} \cdot \boxed{\text{Time}}$

Labels: Interest = \$20,000  
Principal =  $p$   
Rate = 9.5%  
Time = 1

Equation:  $20,000 = p \cdot 0.095 \cdot 1$

$$\frac{20,000}{0.095} = p$$

$$\$210,526.32 = p$$

133. Verbal Model:  $\boxed{\text{Area}} = \boxed{\text{Length}} \cdot \boxed{\text{Width}}$

Labels: Area = 48  
Length =  $x$   
Width = 6

Equation:  $48 = x \cdot 6$

$$8 \text{ inches} = x$$

135. *Verbal Model:*  $50 \leq \boxed{\text{Perimeter}} \leq 100$

*Label:* Perimeter =  $2x + 2(23)$

*Inequality:*  $50 \leq 2x + 2(23) \leq 100$

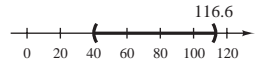
$$4 \leq 2x \leq 54$$

$$2 \leq x \leq 27$$

137.  $|t - 78.3| < 38.3$

$$-38.3 < t - 78.3 < 38.3$$

$$40 < t < 116.6$$



## Chapter Test for Chapter 1

1.  $6x - 5 = 19$

$$6x - 5 + 5 = 19 + 5$$

$$6x = 24$$

$$\frac{6x}{6} = \frac{24}{6}$$

$$x = 4$$

2.  $5x - 6 = 7x - 12$

$$5x - 7x - 6 = 7x - 7x - 12$$

$$-2x - 6 = -12$$

$$-2x - 6 + 6 = -12 + 6$$

$$-2x = -6$$

$$\frac{-2x}{-2} = \frac{-6}{-2}$$

$$x = 3$$

3.  $15 - 7(1 - x) = 3(x + 8)$

$$15 - 7 + 7x = 3x + 24$$

$$8 + 7x = 3x + 24$$

$$8 + 7x - 3x = 3x + 24 - 3x$$

$$8 - 8 + 4x = 24 - 8$$

$$4x = 16$$

$$\frac{4x}{4} = \frac{16}{4}$$

$$x = 4$$

4.  $\frac{2x}{3} = \frac{x}{2} + 4$

$$6\left(\frac{2x}{3}\right) = \left(\frac{x}{2} + 4\right)6$$

$$4x = 3x + 24$$

$$4x - 3x = 3x + 24 - 3x$$

$$x = 24$$

5. *Verbal Model:*  $\boxed{\text{Compared number}} = \boxed{\text{Percent}} \cdot \boxed{\text{Base number}}$

*Labels:* Compared number =  $a$   
Percent =  $p$   
Base number =  $b$

*Equation:*  $a = p \cdot b$

$$x = 0.27 \cdot 3200$$

$$x = 864$$

6. *Verbal Model:*  $\boxed{\text{Compared number}} = \boxed{\text{Percent}} \cdot \boxed{\text{Base number}}$

*Labels:* Compared number =  $a$   
Percent =  $p$   
Base number =  $b$

*Equation:*  $a = p \cdot b$

$$1200 = x \cdot 800$$

$$\frac{1200}{800} = x$$

$$1.5 = x$$

$$150\% = x$$