

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

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

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

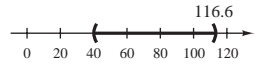
$$4 \leq 2x \leq 54$$

$$2 \leq x \leq 27$$

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: $a = p \cdot b$

$$1200 = x \cdot 800$$

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

$$1.5 = x$$

$$150\% = x$$

7. Verbal Model: $\boxed{\text{Sale price}} = \boxed{\text{Percent}} \cdot \boxed{\text{List price}}$

Labels: Sale price = 6400
 Percent = 80%
 List price = x

Equation: $6400 = 0.80 \cdot x$

$$\frac{6400}{0.80} = x$$

$$\$8000 = x$$

8. $\frac{\text{Total price}}{\text{Total units}} = \frac{2.49}{12} = \frac{249}{1200} = 0.2075$ per ounce

$$\frac{\text{Total price}}{\text{Total units}} = \frac{2.99}{15} = \frac{299}{1500} = 0.199\bar{3}$$
 per ounce

The 15-ounce can is the better buy.

9. Verbal Model: $\frac{\boxed{\text{Tax}}}{\boxed{\text{Assessed value}}} = \frac{\boxed{\text{Tax}}}{\boxed{\text{Assessed value}}}$

Proportion: $\frac{1200}{90,000} = \frac{x}{110,000}$

$$x = \frac{(1200)(110,000)}{90,000}$$

$$x \approx \$1466.67$$

10. Verbal Model: $\boxed{\text{Total bill}} = \boxed{\text{Cost of parts}} + \boxed{\text{Cost of labor}}$

Labels: Total bill = 165
 Cost of parts = 85
 Number of hours of labor = x
 Cost of labor = $6x$

Equation: $165 = 85 + 6x$

$$80 = 16x$$

$$5 \text{ half hours} = x$$

$$x = 2\frac{1}{2} \text{ hours}$$

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

Labels: Number of liters of solution 1 = x
 Percent concentration of solution 1 = 10%
 Number of liters of solution 2 = $100 - x$
 Percent concentration of solution 2 = 40%
 Number of liters of final solution = 100
 Percent concentration of final solution = 30%

Equation: $0.10x + 0.40(100 - x) = 0.30(100)$

$$0.10x + 40 - 0.40x = 30$$

$$-0.30x = -10$$

$$x = 33\frac{1}{3} \text{ liters at 10\%}$$

$$100 - x = 66\frac{2}{3} \text{ liters at 40\%}$$

12. Verbal Model: $\boxed{\text{Distance of car 1}} + 10 \text{ miles} = \boxed{\text{Distance of car 2}}$

Labels: Time = x
 Distance of car 1 = $40x$
 Distance of car 2 = $55x$

Equation: $40x + 10 = 55x$

$$10 = 15x$$

$$\frac{10}{15} = x$$

$$\frac{2}{3} \text{ hour or 40 minutes} = x$$

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

Labels: Interest = 300
Principal = p
Rate = 7.5%
Time = 2

Equation: $300 = p \cdot 0.075 \cdot 2$
 $\$2000 = p$

14. (a) $|2x + 6| = 16$

$$2x + 6 = 16 \quad \text{or} \quad 2x + 6 = -16$$

$$2x = 10 \qquad 2x = -22$$

$$x = 5 \qquad x = -11$$

(b) $|3x - 5| = |6x - 1|$

$$3x - 5 = 6x - 1 \quad \text{or} \quad 3x - 5 = -(6x - 1)$$

$$-3x - 5 = -1 \qquad 3x - 5 = -6x + 1$$

$$-3x = 4 \qquad 9x - 5 = 1$$

$$x = -\frac{4}{3} \qquad 9x = 6$$

$$x = \frac{6}{9} = \frac{2}{3}$$

(c) $|9 - 4x| - 10 = 1$

$$|9 - 4x| = 11$$

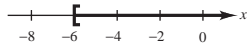
$$9 - 4x = 11 \quad \text{or} \quad 9 - 4x = -11$$

$$-4x = 2 \qquad -4x = -20$$

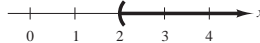
$$x = -\frac{2}{4} \qquad x = 5$$

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

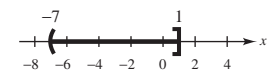
15. (a) $3x + 12 \geq -6$
 $3x + 12 - 12 \geq -6 - 12$
 $3x \geq -18$
 $x \geq -6$



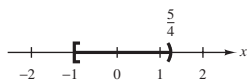
(b) $1 + 2x > 7 - x$
 $3x > 6$
 $x > 2$



(c) $0 \leq \frac{1-x}{4} < 2$
 $0 \leq 1 - x < 8$
 $-1 \leq -x < 7$
 $1 \geq x > -7$



(d) $-7 < 4(2 - 3x) \leq 20$
 $-7 < 8 - 12x \leq 20$
 $-15 < -12x \leq 12$
 $\frac{15}{12} > x \geq -1$
 $-1 \leq x < \frac{5}{4}$



16. (a) $|x - 3| \leq 2$

$$-2 \leq x - 3 \leq 2$$

$$1 \leq x \leq 5$$

(b) $|5x - 3| > 12$

$$5x - 3 > 12 \quad \text{or} \quad 5x - 3 < -12$$

$$5x > 15 \qquad 5x < -9$$

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

(c) $\left| \frac{x}{4} + 2 \right| < 0.2$

$$-0.2 < \frac{x}{4} + 2 < 0.2$$

$$-0.8 < x + 8 < 0.8$$

$$-8.8 < x < -7.2$$

$$-\frac{44}{5} < x < -\frac{36}{5}$$

17. $t \geq 8$ denotes the phrase “ t is at least 8.”

18. Verbal Model:

Operating cost

 $\leq 11,950$

Label: Number of miles = m

Equation: $0.37m + 2700 \leq 11,950$

$$0.37m \leq 9250$$

$$m \leq 25,000 \text{ miles}$$