

# Algebra I

## Lesson 6-2

- I can solve linear inequalities by using multiplication.
- I can solve linear inequalities by using division.

$$\begin{array}{l} 8 > 5 \\ 8 \cdot 2 > 5 \cdot 2 \\ 16 > 10 \end{array}$$

$$\begin{array}{l} 5 < 9 \\ 5 \cdot 2 < 9 \cdot 2 \\ 10 < 18 \end{array}$$

$$\begin{array}{l} 5 > 3 \\ 5 \cdot 2 > 3 \cdot 2 \\ 10 > 6 \end{array}$$

$$\begin{array}{l} -6 < 8 \\ -6 \cdot 2 < 8 \cdot 2 \\ -12 < 16 \end{array}$$

The Multiplication Property of Inequality has two parts.

(1) If each side of a true inequality is multiplied by the same positive number, the resulting inequality is also true.

If  $a$  and  $b$  are any numbers and  $c$  is a positive number, the following are true:

$$\text{If } a < b, \text{ then } ac < bc$$

$$\text{If } a > b, \text{ then } ac > bc$$

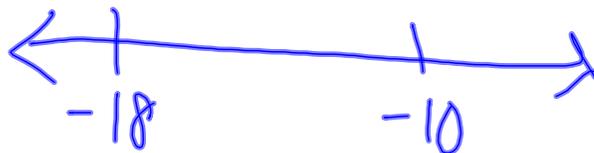
also true for  $\leq$  and  $\geq$

$$\begin{array}{l} 8 > 5 \\ 8(-2) > 5(-2) \\ -16 > -10 \end{array}$$

$$\begin{array}{l} 5 < 9 \\ 5(-2) < 9(-2) \\ -10 < -18 \end{array}$$

$$\begin{array}{l} 5 > 3 \\ 5(-2) > (3)(-2) \\ -10 > -6 \end{array}$$

$$\begin{array}{l} -6 < 8 \\ -6(-2) < 8(-2) \\ 12 < -16 \end{array}$$



(2) If each side of a true inequality is multiplied by the same Negative number, the direction of the inequality symbol must be reversed so that the resulting inequality is also true.

If  $a$  and  $b$  are any numbers and  $c$  is a negative number, the following are true.

$$\text{If } a < b, \text{ then } ac > bc$$

$$\text{If } a > b, \text{ then } ac < bc$$

also true for  $\leq$  and  $\geq$

Solve. Then check your solution.

$$7 \cdot \frac{b}{7} \geq 25 \cdot 7$$

$$b \geq 175$$

$$\checkmark b = 175 \quad \checkmark b = 210$$

$$\frac{175}{7} \geq 25 \quad \frac{210}{7} \geq 25$$

$$25 \geq 25 \quad 30 \geq 25$$

$$\{b \mid b \geq 175\}$$

$$-\frac{5}{2} \cdot -\frac{2}{5}p < -14 \left(-\frac{5}{2}\right)$$

$$p > 35$$

$$\checkmark p = 40$$

$$-\frac{2}{5}(40) < -14$$

$$-16 < -14$$

$$\{p \mid p > 35\}$$

Write an inequality for the sentence. Then solve the inequality.

*One fourth of a number is less than  $-7$ .*

$$4 \cdot \frac{1}{4}n < -7 \cdot 4$$

$$n < -28$$

$$\{n | n < -28\}$$

$$\checkmark n = -16$$

$$\frac{1}{4}(-16) < -7$$

$$-4 < -7$$

The Division Property of Inequality has two parts.

(1) If each side of a true inequality is divided by the same positive number, the resulting inequality is also true.

If  $a$  and  $b$  are any numbers and  $c$  is a positive number, the following are true:

$$\text{If } a < b, \text{ then } \frac{a}{c} < \frac{b}{c}$$

$$\text{If } a > b, \text{ then } \frac{a}{c} > \frac{b}{c}$$

also true for  $\leq$  and  $\geq$

(2) If each side of a true inequality is divided by the same negative number, the direction of the inequality symbol must be reversed so that the resulting inequality is also true.

If  $a$  and  $b$  are any numbers and  $c$  is a negative number, the following are true.

$$\text{If } a < b, \text{ then } \frac{a}{c} > \frac{b}{c}$$

$$\text{If } a > b, \text{ then } \frac{a}{c} < \frac{b}{c}$$

also true for  $\leq$  and  $\geq$

$$\frac{14h}{14} > \frac{91}{14}$$

$$h > 6.5$$

$$\{h \mid h > 6.5\}$$

$$\checkmark h = 7$$

$$14(7) > 91$$

$$98 > 91$$

$$\checkmark h = 6.5$$

$$14(6.5) > 91$$

$$91 \not> 91$$

$$\frac{-5t}{-5} \geq \frac{275}{-5}$$

$$t \leq -55$$

$$\{t \mid t \leq -55\}$$

$$\checkmark t = -55$$

$$-5(-55) \geq 275$$

$$275 \geq 275$$

$$\checkmark t = -50 \quad \text{true}$$

$$-5(-5) \geq 275$$

$$250 \not\geq 275$$

# Assignment

Pgs. 329-330 #14-42 even; 46-52 even