

## Lesson 8-8

### Example 1 Solve Inequalities by Dividing Solve $4m < 96$ . Check your solution.

$$4m < 96 \quad \text{Write the inequality.}$$

$$\frac{4m}{4} < \frac{96}{4} \quad \text{Divide each side by 4.}$$

$$m < 24 \quad \text{Simplify.}$$

The solution is  $m < 24$ .

### Example 2 Solve Inequalities by Multiplying Solve $\frac{1}{8}x \geq -4$ . Check your solution.

$$\frac{1}{8}x \geq -4 \quad \text{Write the inequality.}$$

$$8\left(\frac{1}{8}x\right) \geq 8(-4) \quad \text{Multiply each side by 8.}$$

$$x \geq -32 \quad \text{Simplify.}$$

The solution is  $x \geq -32$ . You can check this solution by substituting  $-32$  and a number greater than  $-32$  into the inequality.

### Example 3 Multiply or Divide by a Negative Number

#### Solve $\frac{n}{-6} < 3$ . Check your solution.

$$\frac{n}{-6} < 3 \quad \text{Write the inequality.}$$

$$-6\left(\frac{n}{-6}\right) > -6(3) \quad \text{Multiply each side by } -6 \text{ and reverse the inequality symbol.}$$

$$n > -18 \quad \text{Check this result.}$$

### Example 4 Multiply or Divide by a Negative Number

#### Solve $-72 \geq -9w$ . Check your solution.

$$-72 \geq -9w \quad \text{Write the inequality.}$$

$$\frac{-72}{-9} \leq \frac{-9w}{-9} \quad \text{Divide each side by } -9 \text{ and reverse the inequality symbol.}$$

$$8 \leq w \text{ or } w \geq 8 \quad \text{Check this result.}$$

**Example 5 Real-World Example**

**REPAIRS** Mrs. Jacobs is hiring a technician to repair her broken refrigerator. The technician charges \$50 for a service call, plus \$25 per hour for labor. Write and solve an inequality to find how many hours the technician has to complete the job, if Mrs. Jacobs wants to pay no more than \$125. Interpret the solution.

The phrase *no more than* means *less than or equal to*. Let  $h$  = the number of hours the technician works. Then write the inequality.

$$\begin{array}{ll} 50 + 25h \leq 125 & \text{Write the inequality.} \\ 50 - 50 + 25h \leq 125 - 50 & \text{Subtract 50 from each side.} \\ 25h \leq 75 & \text{Simplify.} \\ \frac{25h}{25} \leq \frac{75}{25} & \text{Divide each side by 25.} \\ h \leq 3 & \text{Simplify.} \end{array}$$

The technician has no more than 3 hours to complete the job, so Mrs. Jacobs will not have to pay more than \$125.