

# 3-4

## Practice

Form K

### Solving Multi-Step Inequalities

Solve each inequality.

$$1. \begin{array}{r} 3m + 12 < 24 \\ -12 \quad -12 \\ \hline \end{array}$$

$$\frac{3m}{3} < \frac{12}{3}$$

$$m < 4$$

$$2. \begin{array}{r} 4w - 3 \geq 33 \\ +3 \quad +3 \\ \hline \end{array}$$

$$\frac{4w}{4} \geq \frac{36}{4}$$

$$w \geq 9$$

$$3. \begin{array}{r} -2 + 2p \leq -14 \\ +2 \quad +2 \\ \hline \end{array}$$

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

$$p \leq -6$$

$$4. \begin{array}{r} 12 > 60 - 6t \\ -60 \quad -60 \\ \hline \end{array}$$

$$\frac{-48}{-6} > \frac{-6t}{-6}$$

\* FLIP \*

$$8 < t$$

$$t > 8$$

Solve each inequality.

$$5. 4(k + 2) - 3k \leq 12$$

$$4k + 8 - 3k \leq 12$$

$$\frac{k + 8}{-8 \quad -8} \leq \frac{12}{-8}$$

$$k \leq 4$$

$$6. 3(2c - 2) - 2c > 0$$

$$6c - 6 - 2c > 0$$

$$\frac{4c - 6}{+6 \quad +6} > \frac{0}{+6}$$

$$4c > 6$$

$$\frac{4c}{4} > \frac{6}{4}$$

$$c > \frac{3}{2}$$

$$7. 12(j + 1) + 3j < 57$$

$$12j + 12 + 3j < 57$$

$$\frac{15j + 12}{-12 \quad -12} < \frac{57}{-12}$$

$$\frac{15j}{15} < \frac{45}{15}$$

$$j < 3$$

$$8. 22 \geq 5(y - 2) - 3y$$

$$22 \geq 5y - 10 - 3y$$

$$\frac{22 \geq 2y - 10}{+10 \quad +10}$$

$$\frac{32}{2} \geq \frac{2y}{2}$$

$$16 \geq y$$

$$y \leq 16$$

# 3-4 Practice (continued)

## Solving Multi-Step Inequalities

Form K

Solve each inequality, if possible. If the inequality has no solution, write *no solution*. If the solutions are all real numbers, write *all real numbers*.

9.  $8w - 5 > 2(4w - 3)$

$$\begin{array}{r} 8w - 5 > 8w - 6 \\ -8w \quad -8w \\ \hline -5 > -6 \quad \text{True} \end{array} \quad \text{All IR}$$

10.  $-3r + 15 \geq 4(r - 2)$

$$\begin{array}{r} -3r + 15 \geq 4r - 8 \\ +3r \quad +3r \\ \hline 15 \geq 7r - 8 \\ +8 \quad +8 \\ \hline 23 \geq 7r \end{array} \quad \begin{array}{l} \frac{23}{7} \geq \frac{7r}{7} \\ \frac{23}{7} \geq r \quad \text{or} \quad r \leq \frac{23}{7} \end{array}$$

11. A grandmother devises an inequality to help her remember the ages of her two grandchildren. She knows her grandson is two years older than her granddaughter and that together, they are at least 12 years old. What are the youngest that her grandson and granddaughter could be?

Let  $a$  be the age of the granddaughter. Let  $a + \boxed{2}$  be the age of the grandson.

$$\begin{array}{l} a + (a + 2) \geq 12 \\ 2a + 2 \geq 12 \\ 2a \geq 10 \\ a \geq 5 \\ a + 2 = 5 + 2 \\ = 7 \end{array}$$

The grandchildren are at least 5 & 7 years old.

12. A family decides to rent a boat for the day. The boat's rental rate is \$500 for the first two hours and \$50 for each additional half hour. Suppose the family budgeted \$700 to rent the boat. What is the maximum number of additional half hours for which they can rent the boat?

Let  $t$  = the additional time in half hours.

$$\begin{array}{r} \boxed{50}t + \$500 \leq \boxed{700} \\ -500 \quad -500 \\ \hline 50t \leq 200 \\ \frac{50t}{50} \leq \frac{200}{50} \\ t \leq 4 \end{array}$$

They can rent the boat for 4 add'l half hours (or 2 add'l hours).

13. Suppose a friend is having difficulty solving  $-2(q - 5) > -3(q + 1)$ . Explain how to solve the inequality, showing all the necessary steps and identifying the properties you would use.

$$\begin{array}{r} -2(q - 5) > -3(q + 1) \\ -2q + 10 > -3q - 3 \\ +3q \quad +3q \\ \hline q + 10 > -3 \\ -10 \quad -10 \\ \hline q > -13 \end{array} \quad \begin{array}{l} \text{Distributive Prop.} \\ \text{Addition Prop of } = \\ \text{Subtraction Prop of } = \end{array}$$