

**LESSON**  
**7-1**

**Equations with the Variable on Both Sides**

*Practice and Problem Solving: A/B*

Use algebra tiles to model and solve each equation.

1.  $x + 3 = -x - 5$

2.  $1 - 2x = -x - 3$

3.  $x - 2 = -3x + 2$

\_\_\_\_\_

Fill in the boxes to solve each equation.

4.  $4a - 3 = 2a + 7$

5.  $7x - 1 = 2x + 5$

6.  $-3r + 9 = -4r + 5$

$$\begin{array}{r} -2a \quad -[ \quad ] \\ \hline \end{array}$$

$$\begin{array}{r} -[ \quad ] \quad -2x \\ \hline \end{array}$$

$$\begin{array}{r} +[ \quad ] \quad +4r \\ \hline \end{array}$$

$$2a - 3 = 7$$

$$5x - 1 = [ \quad ]$$

$$r + 9 = 5$$

$$+[ \quad ] + 3$$

$$+[ \quad ] + 1$$

$$-[ \quad ] - 9$$

$$2a = [ \quad ]$$

$$5x = [ \quad ]$$

$$r = [ \quad ]$$

$$\frac{2a}{[ \quad ]} = \frac{10}{[ \quad ]}$$

$$\frac{5x}{[ \quad ]} = \frac{6}{[ \quad ]}$$

$$a = [ \quad ]$$

$$x = [ \quad ]$$

Solve.

7.  $3y + 1 = 4y - 6$

8.  $2 + 6x = 1 - x$

9.  $5y + 4 = 4y + 5$

\_\_\_\_\_

Write an equation to represent each relationship. Then solve the equation.

10. Ten less than 3 times a number is the same as the number plus 4.

\_\_\_\_\_

11. Six times a number plus 4 is the same as the number minus 11.

\_\_\_\_\_

12. Fifteen more than twice the hours Carla worked last week is the same as three times the hours she worked this week decreased by 15. She worked the same number of hours each week. How many hours did she work each week?

\_\_\_\_\_

# Key

**LESSON**  
**7-1**

## Equations with the Variable on Both Sides

### Practice and Problem Solving: A/B

②  $1 - 2x = -x - 3$

$$\begin{array}{r} 1 - 2x = -x - 3 \\ + 2x \quad + 2x \\ \hline 1 = x - 3 \\ + 3 \quad + 3 \\ \hline 4 = x \\ x = 4 \end{array}$$

③  $x - 2 = -3x + 2$

$$\begin{array}{r} x - 2 = -3x + 2 \\ + 3x \quad + 3x \\ \hline 4x - 2 = 2 \\ + 2 \quad + 2 \\ \hline 4x = 4 \\ \div 4 \quad \div 4 \\ \hline x = 1 \end{array}$$

Use algebra tiles to model and solve each equation.

①  $2x + 3 = 5$

$$\begin{array}{r} 2x + 3 = 5 \\ -3 \quad -3 \\ \hline 2x = 2 \\ \div 2 \quad \div 2 \\ \hline x = 1 \end{array}$$

2.  $1 - 2x = -x - 3$

$$\begin{array}{r} 1 - 2x = -x - 3 \\ + 2x \quad + 2x \\ \hline 1 = x - 3 \\ + 3 \quad + 3 \\ \hline 4 = x \\ x = 4 \end{array}$$

3.  $x - 2 = -3x + 2$

$$\begin{array}{r} x - 2 = -3x + 2 \\ + 3x \quad + 3x \\ \hline 4x - 2 = 2 \\ + 2 \quad + 2 \\ \hline 4x = 4 \\ \div 4 \quad \div 4 \\ \hline x = 1 \end{array}$$

Fill in the boxes to solve each equation.

4.  $4a - 3 = 2a + 7$

$$\begin{array}{r} 4a - 3 = 2a + 7 \\ -2a \quad -[2a] \\ \hline 2a - 3 = 7 \\ +[9] \quad +3 \\ \hline 2a = [10] \\ \div 2 \quad \div 2 \\ \hline a = [5] \end{array}$$

5.  $7x - 1 = 2x + 5$

$$\begin{array}{r} 7x - 1 = 2x + 5 \\ -[2x] \quad -2x \\ \hline 5x - 1 = [5] \\ +[1] \quad +1 \\ \hline 5x = [6] \\ \div 5 \quad \div 5 \\ \hline x = [6/5] \end{array}$$

*Handwritten note: (10/5) = 2, (10/5) = 2*

6.  $-3r + 9 = -4r + 5$

$$\begin{array}{r} -3r + 9 = -4r + 5 \\ +[4r] \quad +4r \\ \hline r + 9 = 5 \\ -[9] \quad -9 \\ \hline r = [-4] \end{array}$$

Solve.

7.  $3y + 1 = 4y - 6$

$$\begin{array}{r} 3y + 1 = 4y - 6 \\ -3y \quad -3y \\ \hline 1 = y - 6 \\ +6 \quad +6 \\ \hline 7 = y \\ y = 7 \end{array}$$

8.  $2 + 6x = 1 - x$

$$\begin{array}{r} 2 + 6x = 1 - x \\ +x \quad +x \\ \hline 2 + 7x = 1 \\ -2 \quad -2 \\ \hline 7x = -1 \\ \div 7 \quad \div 7 \\ \hline x = -1/7 \end{array}$$

9.  $5y + 4 = 4y + 5$

$$\begin{array}{r} 5y + 4 = 4y + 5 \\ -4y \quad -4y \\ \hline y + 4 = 5 \\ -4 \quad -4 \\ \hline y = 1 \end{array}$$

Write an equation to represent each relationship. Then solve the equation.

10. Ten less than 3 times a number is the same as the number plus 4.

$$\begin{array}{r} 3x - 10 = x + 4 \\ -x \quad -x \\ \hline 2x - 10 = 4 \\ +10 \quad +10 \\ \hline 2x = 14 \\ \div 2 \quad \div 2 \\ \hline x = 7 \end{array}$$

11. Six times a number plus 4 is the same as the number minus 11.

$$\begin{array}{r} 6x + 4 = x - 11 \\ -x \quad -x \\ \hline 5x + 4 = -11 \\ -4 \quad -4 \\ \hline 5x = -15 \\ \div 5 \quad \div 5 \\ \hline x = -3 \end{array}$$

12. Fifteen more than twice the hours Carla worked last week is the same as three times the hours she worked this week decreased by 15. She worked the same number of hours each week. How many hours did she work each week?

$$\begin{array}{r} 2x + 15 = 3x - 15 \\ -2x \quad -2x \\ \hline 15 = x - 15 \\ +15 \quad +15 \\ \hline 30 = x \\ x = 30 \end{array}$$

30 hours

Handwritten work for problem 10:

$$\begin{array}{r} 3x - 10 = x + 4 \\ -x \quad -x \\ \hline 2x - 10 = 4 \\ +10 \quad +10 \\ \hline 2x = 14 \\ \div 2 \quad \div 2 \\ \hline x = 7 \end{array}$$

Handwritten work for problem 11:

$$\begin{array}{r} 6x + 4 = x - 11 \\ -x \quad -x \\ \hline 5x + 4 = -11 \\ -4 \quad -4 \\ \hline 5x = -15 \\ \div 5 \quad \div 5 \\ \hline x = -3 \end{array}$$

Handwritten work for problem 12:

$$\begin{array}{r} 2x + 15 = 3x - 15 \\ -2x \quad -2x \\ \hline 15 = x - 15 \\ +15 \quad +15 \\ \hline 30 = x \\ x = 30 \end{array}$$