

# Study Guide and Intervention *(continued)*

## Solving Equations

**Properties of Equality** You can solve equations by using addition, subtraction, multiplication, or division.

<b>Addition and Subtraction Properties of Equality</b>	For any real numbers $a$ , $b$ , and $c$ , if $a = b$ , then $a + c = b + c$ and $a - c = b - c$ .
<b>Multiplication and Division Properties of Equality</b>	For any real numbers $a$ , $b$ , and $c$ , if $a = b$ , then $a \cdot c = b \cdot c$ and, if $c$ is not zero, $\frac{a}{c} = \frac{b}{c}$ .

**Example 1** Solve  $100 - 8x = 140$ .

$$\begin{aligned} 100 - 8x &= 140 \\ 100 - 8x - 100 &= 140 - 100 \\ -8x &= 40 \\ x &= -5 \end{aligned}$$

**Example 2** Solve  $4x + 5y = 100$  for  $y$ .

$$\begin{aligned} 4x + 5y &= 100 \\ 4x + 5y - 4x &= 100 - 4x \\ 5y &= 100 - 4x \\ y &= \frac{1}{5}(100 - 4x) \\ y &= 20 - \frac{4}{5}x \end{aligned}$$

### Exercises

Solve each equation. Check your solution.

1.  $3s = 45$

2.  $17 = 9 - a$

3.  $5t - 1 = 6t - 5$

4.  $\frac{2}{3}m = \frac{1}{2}$

5.  $7 - \frac{1}{2}x = 3$

6.  $-8 = -2(z + 7)$

7.  $0.2b = 10$

8.  $3x + 17 = 5x - 13$

9.  $5(4 - k) = -10k$

10.  $120 - \frac{3}{4}y = 60$

11.  $\frac{5}{2}n = 98 - n$

12.  $4.5 + 2p = 8.7$

13.  $4n + 20 = 53 - 2n$

14.  $100 = 20 - 5r$

15.  $2x + 75 = 102 - x$

Solve each equation or formula for the specified variable.

16.  $a = 3b - c$ , for  $b$

17.  $\frac{s}{2t} = 10$ , for  $t$

18.  $h = 12g - 1$ , for  $g$

19.  $\frac{3pq}{r} = 12$ , for  $p$

20.  $2xy = x + 7$ , for  $x$

21.  $\frac{d}{2} + \frac{f}{4} = 6$ , for  $f$

22.  $3(2j - k) = 108$ , for  $j$

23.  $3.5s - 42 = 14t$ , for  $s$

24.  $\frac{m}{n} + 5m = 20$ , for  $m$

25.  $4x - 3y = 10$ , for  $y$