

**1-2 Study Guide and Intervention** *(continued)***Order of Operations**

**Evaluate Algebraic Expressions** Algebraic expressions may contain more than one operation. Algebraic expressions can be evaluated if the values of the variables are known. First, replace the variables by their values. Then use the order of operations to calculate the value of the resulting numerical expression.

**Example**

**Evaluate  $x^3 + 5(y - 3)$  if  $x = 2$  and  $y = 12$ .**

$$\begin{aligned} x^3 + 5(y - 3) &= 2^3 + 5(12 - 3) && \text{Replace } x \text{ with } 2 \text{ and } y \text{ with } 12. \\ &= 8 + 5(12 - 3) && \text{Evaluate } 2^3. \\ &= 8 + 5(9) && \text{Subtract } 3 \text{ from } 12. \\ &= 8 + 45 && \text{Multiply } 5 \text{ and } 9. \\ &= 53 && \text{Add } 8 \text{ and } 45. \end{aligned}$$

The solution is 53.

**Exercises**

**Evaluate each expression if  $x = 2$ ,  $y = 3$ ,  $z = 4$ ,  $a = \frac{4}{5}$ , and  $b = \frac{3}{5}$ .**

1.  $x + 7$

2.  $3x - 5$

3.  $x + y^2$

4.  $x^3 + y + z^2$

5.  $6a + 8b$

6.  $23 - (a + b)$

7.  $\frac{y^2}{x^2}$

8.  $2xyz + 5$

9.  $x(2y + 3z)$

10.  $(10x)^2 + 100a$

11.  $\frac{3xy - 4}{7x}$

12.  $a^2 + 2b$

13.  $\frac{z^2 - y^2}{x^2}$

14.  $6xz + 5xy$

15.  $\frac{(z - y)^2}{x}$

16.  $\frac{25ab + y}{xz}$

17.  $\frac{5a^2b}{y}$

18.  $(z \div x)^2 + ax$

19.  $\left(\frac{x}{z}\right)^2 + \left(\frac{y}{z}\right)^2$

20.  $\frac{x + z}{y + 2z}$

21.  $\left(\frac{z \div x}{y}\right) + \left(\frac{y \div x}{z}\right)$