



Name \_\_\_\_\_ Date \_\_\_\_\_

# Variables, Expressions, and Equations

(Pages 11–15)

**Variables**, usually letters, are used to represent numbers in some expressions. **Algebraic expressions** are combinations of variables, numbers, and at least one operation. A mathematical sentence that contains an “=” is called an **equation**. The values of a variable that make an equation true are the **solutions** of the equation.

<b>Reading Algebraic Expressions</b>	$3(2)$ means $3 \times 2$	$8ab^2$ means $8 \times a \times b \times b$
	$2n$ means $2 \times n$	$a[b(cd)]$ means $a \times [b \times (c \times d)]$
	$np$ means $n \times p$	$\frac{x}{10z}$ means $x \div (10 \times z)$
	$4 \cdot 7a$ means $4 \times 7 \times a$	$a\left(\frac{b}{3}\right)$ means $a \times (b \div 3)$
<b>Order of Operations</b>	<ol style="list-style-type: none"> <li>1. Do all operations within grouping symbols first; start with the innermost grouping symbols.</li> <li>2. Do all powers before other operations.</li> <li>3. Multiply and divide in order from left to right.</li> <li>4. Add and subtract in order from left to right.</li> </ol>	

## EXAMPLES

Evaluate each expression if  $a = 3$  and  $b = 5$ .

**A**  $3(2ab)$

$$\begin{aligned} 3(2ab) &= 3 \times (2 \times 3 \times 5) \\ &= 3 \times (30) \\ &= 90 \end{aligned}$$

**B**  $a^2\left(\frac{6b}{2}\right)$

$$\begin{aligned} a^2\left(\frac{6b}{2}\right) &= 3^2\left(\frac{6 \cdot 5}{2}\right) \\ &= 3 \times 3 \times (6 \times 5 \div 2) \\ &= 3 \times 3 \times (15) \\ &= 9 \times 15 \\ &= 135 \end{aligned}$$

## Try These Together

Evaluate each expression.

1.  $8 \div 4 + 2$

2.  $9^3 - 5$

*HINT: Remember the order of operations.*

## PRACTICE

Evaluate each expression if  $a = 2$ ,  $b = 8$ ,  $c = 4$ , and  $d = 12$ .

3.  $2a + (bc - 12)$

4.  $5a + 2b - 3c$

5.  $(d \div c) + (2b - a)$



6. **Standardized Test Practice** Prathna needs to figure out how many people can watch the class play. There are 10 rows that each have 12 seats. Solve the equation  $10 \times 12 = s$  to find the number of seats.

**A** 100

**B** 120

**C** 110

**D** 90

Answers: 1. 4 2. 724 3. 24 4. 14 5. 17 6. B