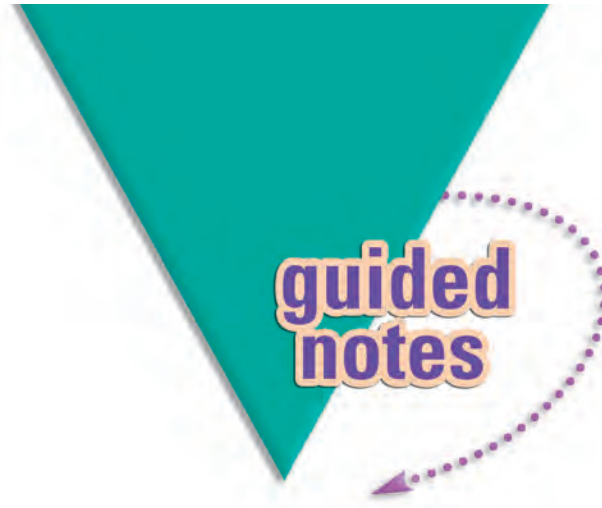


NAME \_\_\_\_\_

**Module 1** Getting Ready for Algebra  
**Lesson 4** Simplifying Expressions with Exponents and Roots



guided notes

### Lesson Objectives

- Simplify expressions of the form  $b^n$ , where  $n$  is a whole number and  $b$  is a rational number.
- Simplify square roots and cube roots.

An exponential expression takes the form  $b^n$ .

The expression  $b^2$  can be read as  **$b$  to the second power** \_\_\_\_\_ or  **$b$  squared** \_\_\_\_\_.

The expression  $b^3$  can be read as  **$b$  to the third power** \_\_\_\_\_ or  **$b$  cubed** \_\_\_\_\_.

In this expression,  $b$  is the **base** \_\_\_\_\_ and  $n$  is the **exponent** \_\_\_\_\_.

To simplify  $b^n$ , use  **$b$**  \_\_\_\_\_ as a factor  **$n$**  \_\_\_\_\_ times.

The **expanded** \_\_\_\_\_ form of  $3^4$  is  $3 \cdot 3 \cdot 3 \cdot 3$ .

For any real number  $b$ , except  $b = 0$ ,  $b^0 = \mathbf{1}$  \_\_\_\_\_.

1 Simplify:  $4^2$

**16** \_\_\_\_\_

2 Simplify:  $8^0$

**1** \_\_\_\_\_

3 Simplify:  $3^1$

**3** \_\_\_\_\_

4 Simplify:  $\left(\frac{1}{4}\right)^3$

**$\frac{1}{64}$**  \_\_\_\_\_

(negative)<sup>even</sup> = **positive** \_\_\_\_\_

(negative)<sup>odd</sup> = **negative** \_\_\_\_\_

5 Determine the sign of  $(-1)^{14}$ , then simplify.

- The sign will be **positive** \_\_\_\_\_.
- $(-1)^{14} = \mathbf{1}$  \_\_\_\_\_

6 Determine the sign of  $\left(-\frac{1}{3}\right)^3$ , then simplify.

- The sign will be **negative**.
- $\left(-\frac{1}{3}\right)^3 = \underline{-\frac{1}{27}}$

The  $\sqrt{\quad}$  symbol is called a **radical** sign.

The  $\sqrt{\quad}$  symbol indicates the principle, or nonnegative, square root.

The symbol  $\sqrt[3]{\quad}$  indicates the **cube** root.

7 Simplify:  $\sqrt{100} =$

**10**

8 Simplify:  $\sqrt[3]{27} =$

**3**

9 Simplify:  $\sqrt[3]{-216} =$

**-6**