1–3 Powers and Exponents

Main Idea

- Use powers and exponents in expressions.

Build Your Vocabulary (pages 2–3)

A product of ____ factors can be written using an **exponent** and a **base**.

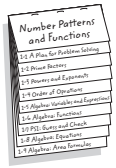
____ → 2^5 ← ____

Numbers expressed using ____ are called **powers**. Three to the second power or three **squared** is 3 × 3, or ____. Ten to the third power or ten **cubed** is 10 × 10 × 10, or ____.

Foldables

Organize It

On the Lesson 1-3 tab, write a power. Then write the power as a product of primes. Label all the parts.



Examples: Write Powers and Products

1 **Write 5 × 5 × 5 × 5 using an exponent.**

The base is ____. Since ____ is a factor ____ times, the exponent is ____. 5 × 5 × 5 × 5 = ____

2 **Write 8^3 as a product of the same factor. Then find the value.**

The base is ____. The exponent is ____. So, ____ is a factor ____ times. 8^3 = ____ or ____

Write It

Explain what 3^1 means.

_____

_____

_____

_____

Check Your Progress

a. Write 4 × 4 × 4 × 4 × 4 × 4 × 4 using an exponent.

b. Write 6^4 as a product of the same factor. Then find the value.

EXAMPLE

3 **ELEVATIONS** **The highest point in Utah is King's Peak. It stands just a bit higher than 4^6 meters. What is this elevation?**

Write 4^6 as a _____. Then find the _____ of the product.

$4^6 =$ _____

$=$ _____

So, the elevation of King's Peak is about _____.

Check Your Progress **SWIMMING POOL** The length of a new swimming pool being built at the community recreation center is listed as 2^6 feet. What is the length of the new pool?

_____

EXAMPLES **Prime Factorization Using Exponents**

Write the prime factorization of each number using exponents.

4 **108**

$108 =$ _____ Write the prime factorization.

$=$ _____ Write products of identical factors using exponents.

5 **80**

$80 =$ _____ Write the prime factorization.

$=$ _____ Write products of identical factors using exponents.

Check Your Progress **Write the prime factorization of each number using exponents.**

a. 144 **b.** 162

_____ _____

HOMEWORK ASSIGNMENT

Page(s):

Exercises: