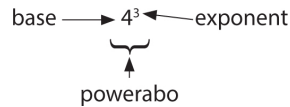# Reteach 4-1 - PreAlgebra
Powers and Exponents

A number that is expressed using an exponent is called a **power.** The **base** is the number that is multiplied. The **exponent** tells how many times the base is used as a factor. So, 4^3 has a base of 4 and an exponent of 3, and

$4^3 = 4 \cdot 4 \cdot 4 = 64$.

$$\text{base} \longrightarrow 4^3 \longleftarrow \text{exponent}$$

$$\underbrace{}$$

$$\text{powerabo}$$

Example 1: Write each expression using exponents.

a. $10 \cdot 10 \cdot 10 \cdot 10 \cdot 10$

The base is 10. It is a factor 5 times, so the exponent is 5.

$10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 = 10^5$

b. $(p + 2)(p + 2)(p + 2)$

The base is $p + 2$. It is a factor 3 times, so the exponent is 3.

$(p + 2)(p + 2)(p + 2) = (p + 2)^3$

When evaluating expressions with exponents, follow the order of operations.

Example 2: Evaluate $x^2 - 4$ if $x = -6$.

$x^2 - 4 = (-6)^2 - 4$	Replace x with –6.
$= (-6)(-6) - 4$	–6 is a factor 2 times.
$= 36 - 4$	Multiply.
$= 32$	Subtract.

Exercises
Write each expression using exponents.

1. $5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5$

2. $(-7)(-7)(-7)$

3. $\left(\frac{1}{3}\right) \cdot \left(\frac{1}{3}\right) \cdot \left(\frac{1}{3}\right) \cdot \left(\frac{1}{3}\right)$

4. $x \cdot x \cdot y \cdot y$

5. $(z - 4)(z - 4)$

6. $3(-t)(-t)(-t)$

Evaluate each expression if $g = 3$, $h = -1$, and $m = 9$.

7. g^5

8. $5g^2$

9. $g^2 - m$

10. $4(2m - 3)^2$

11. $-2(g^3 + 1)$

12. $5(h^4 - m^2)$