# Lesson 13: Exponent Rules

## Definitions: Exponent, Base

Think about the following: $a^3$ What does it mean?

In the **exponential** expression $a^3$ (read "a to the third power"), **a** is called the **base** and **3** is called the **exponent.**

Definition: If *a* is a nonzero real number and *n* is a positive integer, then $a^n = a \cdot a \cdot a \cdot \ldots \cdot a$

$$2^5 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 32$$

TRY: $4^3$

Be careful: Expressions of the form $(-2)^4$ and $-2^4$ These expressions are not always equal.

$(-2)^4 = (-2) \cdot (-2) \cdot (-2) \cdot (-2) = 16$ $-2^4 = -2 \cdot 2 \cdot 2 \cdot 2 = -16$

The placement of the ( ) makes a difference.

TRY: $(-3)^2$ and $-3^2$