Exponents

An **exponent** shows how many times a **base number** occurs as a factor. Exponents show repeated multiplication.

When working with exponents, remember that any base number (except zero) with zero as the exponent equals 1. (0^0 is not defined.) Also, any base number with 1 as the exponent equals the base number.

Example

What is the value of 3^5?

The exponent (^{5}) shows that the base number (3) occurs as a factor 5 times.

To Solve

Multiply First 2 numbers and put answer above 3rd number. Repeat process

$$3^5 = 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 = 243$$

(exponent: 5; base number: 3; 3 • 3 = 9; 9 • 3 = 27; 27 • 3 = 81; 81 • 3 = 243)

Therefore, $3^5 = 243$.

* THE EXPONENT TELLS YOU how many TIMES to write the Base Number in a Multiplication problem

Example

How is 625 written using exponents?

First, write 625 using repeated multiplication of the same factor.

$625 = 5 \cdot 5 \cdot 5 \cdot 5$

Next, write the factor as the base number and the number of times you multiplied that factor as the exponent.

$5 \cdot 5 \cdot 5 \cdot 5 = 5^4$

Therefore, $625 = 5^4$.

* ANY NUMBER TO THE 0 POWER EQUALS 1

* ANY NUMBER TO THE 1st POWER EQUALS THAT NUMBER

TIP: Exponents are called **powers** when you read them. An exponent of 2 can be read as "to the second power" or "squared," and an exponent of 3 can be read as "to the third power" or "cubed."