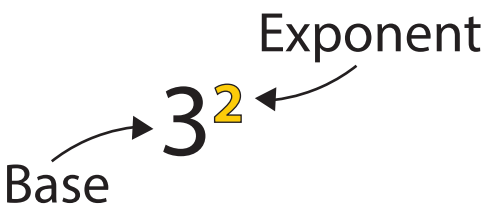
EXPONENTS AND ROOTS

An **exponent** is a shorthand way to note how many times to multiply the base number by itself. It's written as a superscript number on the right-hand side of the base number:



Any number raised to the 1 is just the number itself. For instance, 3 raised to the 1 is just 3. On the left, we see 3 raised to the 2, which would be 3·3=9. Any real number raised to the 0 is equal to 1. It doesn't matter if it is a positive number or a negative number. Any real non-zero number raised to the power of 0 is equal to 1.

A number with an exponent of 2 is said to be "squared," and a number with an exponent of 3 is said to be "cubed."

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

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

$7^2 = 7 \cdot 7 = 49$

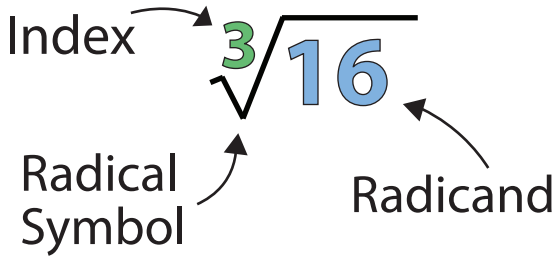
$1^9 = 1 \cdot 1 \cdot 1 \cdot 1 \cdot 1 \cdot 1 \cdot 1 \cdot 1 \cdot 1 = 1$

A **root** is another way of writing a fractional exponent. It is the opposite operation of applying exponents. In other words, a root essentially "undoes" an exponent.

Instead of using an exponent, roots use a radical symbol to indicate the operation.

A radical will have a number underneath the bar and may sometimes have a number in the upper left, called the index.

If there is no index number written, it is assumed to be 2.



$\sqrt{16} = 4$

This is because 4^2=16.

$\sqrt{36} = 6$

This is because 6^2=36.

$\sqrt[3]{343} = 7$

This is because 7^3=343.