Indices

Related terms

1. A Power is the product of a number by itself. It is represented with a base number and an exponent.
   We know that $a^3 = a \times a \times a$
   $a^7 = a \times a \times a \ldots\ldots$ 7 times
   Similarly, $a^m = a \times a \times a \ldots\ldots$ m times
   In this example m is called index or exponent or power and *a* is called the base.
2. Index is a number which indicates how many times another number, the base, is being used as a repeated factor.

Laws of Indices

1. $a^m \times a^n = a^{m+n}$ (Product Law)
2. $a^m \div a^n = a^{m-n}$ (Quotient Law)
3. $(a^m)^n = a^{mn}$ (Power Law)
4. $(a \times b)^m = a^m \times b^m$
5. $a^{-m} = \frac{1}{a^m}$
6. If $a \neq 0$ and n is a positive integer, then $\sqrt[n]{a} = a^{\frac{1}{n}}$
7. If $a \neq 0$ and n is a positive integer, then $a^{\frac{m}{n}} = \sqrt[n]{a^m}, n \in N$
8. For any non-zero, a, $a^n = \frac{1}{a^{-n}}$ and $a^{-n} = \frac{1}{a^n}$
9. For any non-zero number raised to the power zero is always equal to unity,
   That is, $a^0 = 1$
10. $(-a)^m = a^m$; if m is an even number
11. $(-a)^m = -a^m$; if m is an odd number