Indices

Indices are a notation used to represent multiples of the same quantity:

$$a^2 = a \times a$$

$$b^3 = b \times b \times b$$

$$c^1 = c$$

In an expression such as 2^6 the base is 2 and the index or power is 6. A negative power indicates division by a multiple of the same quantity.

$$3^{-2} = \frac{1}{3^2} = \frac{1}{9}$$

$$a^{-1} = \frac{1}{a}$$

$$b^{-4} = \frac{1}{b^4} = \frac{1}{b \times b \times b \times b}$$

The rules for manipulating indices are:

$$a^m \times a^n = a^{m+n} \tag{1}$$

$$\frac{a^m}{a^n} = a^{m-n} \tag{2}$$

$$(a^m)^n = a^{mn} \tag{3}$$

$$a^0 = 1 \tag{4}$$

These rules apply for all values of m and n.