Index laws



The *index laws* are the rules by which indices (powers) may be combined.

The basic rules are:

$$a^{1} = a$$

$$a^{m} \cdot a^{n} = a^{m+n}$$

$$(a^{m})^{n} = a^{mn}$$

$$a^{m} \cdot b^{m} = (ab)^{m}$$

From these we can derive other important rules:

$$a^{0} = 1$$

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

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

$$a^{1/n} = \sqrt[n]{a}$$

These rules are valid for a and b positive real numbers and m and n rational numbers, or a and b any numbers and m and n integers.