

# EXPONENTS

If 'm' is a positive integer, then  $a \times a \times a \dots$  up to 'm' terms is written as  $a^m$ , where 'a' is the base and 'm' is the power.

## LAWS OF INDICES

- **1<sup>ST</sup> LAW (Product Law)** :  $a^m \times a^n = a^{m+n}$
- **2<sup>nd</sup> LAW (Quotient Law)** :  $\frac{a^m}{a^n} = a^{m-n}$  where  $m > n$  ;  $\frac{a^m}{a^n} = \frac{1}{a^{n-m}}$  where  $n > m$
- **3<sup>rd</sup> LAW (Power Law)** :  $(a^m)^n = a^{m \times n}$

## MORE ABOUT EXPONENTS

- $(a \times b)^m = a^m \times b^m$
- $\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$
- If  $a \neq 0$  and 'n' is a positive integer, then  $\sqrt[n]{a} = a^{1/n}$
- $a^{\frac{m}{n}} = \sqrt[n]{a^m}$  where  $a \neq 0$  and  $n \in N$
- **For any non zero number a**,  $a^n = \frac{1}{a^{-n}}$  and  $a^{-n} = \frac{1}{a^n}$
- **A non zero number raised to the power zero is always equal to unity (i.e. 1)**

## KNOW THIS

- $a^0 = 1$
- $a^1 = a$
- $a^1 a^{-1} = 1$
- $0^m = 0$
- $(-a)^m = a^m$  ; if m is even number