

Exponents

Note: $3^4 \rightarrow$ 3 is the **base**

\rightarrow 4 is the **exponent**

3^4 means you multiply the base by itself the number of times indicated by the exponent

Exponential Expression: any term to the power of a given exponent

Eg. (1) $3^4 = (3)(3)(3)(3) = 81$

(2) $x^3 = (x)(x)(x)$

(3) $m^1 = m$

(4) $5^0 = 1$ \longrightarrow

Note: any number not equal to zero raised to the power of zero is equal to one (1).

Rules:

$a^n = \underbrace{(a)(a)(a) \dots (a)}_{n \text{ times}}$	e.g. $5^3 = (5)(5)(5) = 125$
$a^1 = a$	e.g. $5^1 = 5$
$a^0 = 1$	e.g. $5^0 = 1$
$a^{-n} = \frac{1}{a^n}$	e.g. $5^{-2} = \frac{1}{5^2} = \frac{1}{25} = 0.04$
$a^{\frac{1}{n}} = \sqrt[n]{a}$	e.g. $25^{\frac{1}{2}} = \sqrt{25} = 5$

What about...

	<u>Statement</u>	<u>Expanded Form</u>	<u>Evaluate</u>
(a)	4^2	$(4)(4)$	16
(b)	5^3	$(5)(5)(5)$	125
(c)	$16^{\frac{1}{2}}$	$\sqrt{16}$	4
(d)	3^{-3}	$\frac{1}{3^3}$	$\frac{1}{27}$
(e)	$64^{1/3}$	$\sqrt[3]{64}$	4