INDEX LAWS FOR MULTIPLICATION AND DIVISION

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

examples: $3^2 \times 3^4 = 3 \times 3 \times 3 \times 3 \times 3 \times 3 = 3^6$

$2^3 \times 2^5 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 2^8$

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

example:

$3^4 \div 3^2 = 3 \times 3 \times 3 \times 3 \div 3 \div 3 = 3^{4-2} = 3^2$

POWER OF ZERO - POWER OF POWER

if $a \neq 0$ $\quad a^0 = a^{n-n} = a^n \div a^n = 1$ $\quad$ so $a^0 = 1$

example: $(3^4)^0 = 1$

$(a^n)^m = a^{n \times m}$

example:

$(2^4)^2 = (2\times2\times2\times2)\times(2\times2\times2\times2) = 2^{4\times2} = 2^8$