

Power of 1  $[a^1]$

Power of 0  $[a^0]$

Multiplication of  
Bases  $[a^m \cdot a^n]$

Division of  
Bases  $\left[\frac{a^m}{a^n}\right]$

Power to a Power  
 $[(a^m)^n]$

Negative Exponents  
 $[a^{-n}]$  or  $\left[\frac{1}{a^n}\right]$

Power of a Product  
or Quotient  
 $[(a^m b^n)^x]$  or  $\left[\left(\frac{a^m}{b^n}\right)^x\right]$

EXPONENT RULES

## Power of 1

Anything raised to the 1<sup>st</sup> power is the base.

$$x^1 = x \quad 5^1 = 5 \quad y^1 = y$$

When like bases are multiplied, ADD the exponents.

When like bases are divided, SUBTRACT the exponents & put leftovers where bigger exponent was.

When power raised to a power, MULTIPLY EXPONENTS

## Power of 0

Anything raised to the zero power is 1.

$$x^0 = 1 \quad 8^0 = 1 \quad (x^3 y^5)^0 = 1$$

EX:

$$\textcircled{1} x^5 \cdot x^2 = x^7 \quad \textcircled{2} (y^4)(xy) = xy^5$$

EX:

$$\textcircled{1} \frac{x^4}{x^2} = x^2 \quad \textcircled{2} \frac{y^3}{y^7} = \frac{1}{y^4}$$

EX:

$$\textcircled{1} (x^4)^2 = x^8$$

## NO NEGATIVE EXPONENTS!!

To get rid of negative exponents, flip to opposite side of fraction & make positive.

EX:

$$\textcircled{1} x^{-2} = \frac{1}{x^2} \quad \textcircled{2} \frac{1}{y^{-5}} = y^5$$

Give exponent on outside to each piece on inside.

EX:

$$\textcircled{1} (x^5 y^4)^2 = x^{10} y^8 \quad \textcircled{2} \left(\frac{x^3}{y^5}\right)^3 = \frac{x^9}{y^{15}}$$

EXPONENT RULES



EX:

$$\textcircled{1} (-4x^2)(3x^3)$$
$$\boxed{-12x^5}$$

$$\textcircled{2} \frac{2x^5y^7}{4x^3y^9}$$
$$\boxed{\frac{1x^2}{2y^2}}$$

$$\textcircled{3} (3x^4)^2(-2x^5y^{-3})^2$$
$$(9x^8)(4x^{10}y^{-6})$$
$$\boxed{\frac{36x^{18}}{y^6}}$$

$$\textcircled{4} (c^1d^{-3})^{-2}$$
$$c^{-2}d^6$$
$$\boxed{\frac{d^6}{c^2}}$$