

## Exponent Properties

### 1. Zero Exponent:

Any number raised to the zero power is equal to 1.

$$a^0 = 1 ; a \neq 0$$

$$\text{Example: } 4^0 = 1 \text{ and } 2500^0 = 1$$

### 2. Negative Exponent:

Negative exponents indicate reciprocation, with the exponent of the reciprocal becoming positive.

$$a^{-n} = \frac{1}{a^n} \text{ or } \frac{1}{a^{-n}} = a^n ; a \neq 0$$

$$\text{Example: } 3^{-2} = \frac{1}{3^2} \text{ or } \frac{1}{4^{-3}} = 4^3$$

### 3. Product of like bases:

To multiply powers with the same base, add the exponents and keep the common base.

$$a^m a^n = a^{m+n} ; a \neq 0$$

$$\text{Example: } 2^3 2^2 = 2^5 = 32$$

### 4. Quotient of like bases:

To divide powers with the same base, subtract the exponents and keep the common base.

$$\frac{a^m}{a^n} = a^{m-n} ; a \neq 0$$

$$\text{Example: } \frac{3^5}{3^3} = 3^{5-3} = 3^2$$

