Laws of Exponents

Jonathan R. Bacolod

Sauyo High School

What is an Exponential Number?

An exponential number or expression is composed of two parts:

1. Base: the number or variable that is being multiplied repeatedly in the expanded form

What is an Exponential Number?

An exponential number or expression is composed of two parts:

1. Base: the number or variable that is being multiplied repeatedly in the expanded form
2. Exponent: the value that specifies how many times the base will be multiplied by itself

What is an Exponential Number?

In symbols,

$$b^n$$

where b is the base and n is the exponent.

What are the Exponent Rules?

1. Zero Property of Exponents

What are the Exponent Rules?

1. Zero Property of Exponents
2. Negative Property of Exponents

What are the Exponent Rules?

1. Zero Property of Exponents
2. Negative Property of Exponents
3. Product Property of Exponents

What are the Exponent Rules?

1. Zero Property of Exponents
2. Negative Property of Exponents
3. Product Property of Exponents
4. Quotient Property of Exponents

What are the Exponent Rules?

1. Zero Property of Exponents
2. Negative Property of Exponents
3. Product Property of Exponents
4. Quotient Property of Exponents
5. Power of a Power Property of Exponents

What are the Exponent Rules?

1. Zero Property of Exponents
2. Negative Property of Exponents
3. Product Property of Exponents
4. Quotient Property of Exponents
5. Power of a Power Property of Exponents
6. Power of a Product Property of Exponents

What are the Exponent Rules?

1. Zero Property of Exponents
2. Negative Property of Exponents
3. Product Property of Exponents
4. Quotient Property of Exponents
5. Power of a Power Property of Exponents
6. Power of a Product Property of Exponents
7. Power of a Quotient Property of Exponents

What is the Zero Property of Exponents?

Any base (except 0) raised to the zero power is equal to one.
In symbols,

$$b^0 = 1$$

What is the Negative Property of Exponents?

If the exponent is negative, it is changed into positive exponent by writing the same in the denominator and 1 in the numerator. In symbols,

$$a^{-m} = \frac{1}{a^m} \text{ or } \frac{1}{a^{-m}} = a^m$$

What is the Negative Property of Exponents?

If a is a non-zero integer or a non-zero rational number and m is a positive integer, then a^{-m} is the reciprocal of a^m.
In symbols,

$$\left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^{n}$$

What is the Product Property of Exponents?

To multiply when two bases are the same, write the base and add the exponents.
In symbols,

$$x^m \cdot x^n = x^{m+n}$$

What is the Quotient Property of Exponents?

To divide when two bases are the same, write the base and subtract the exponents. In symbols,

$$\frac{x^m}{x^n} = x^{m-n}$$

What is the Power of a Power Property of Exponents?

To raise a power to another power, write the base and multiply the exponents.
In symbols,

$$(x^m)^n = x^{m \cdot n}$$

What is the Power of a Product Property of Exponents?

To find a power of a product, find the power of each factor and then multiply.
In symbols,

$$(ab)^m = a^m b^m$$

What is the Power of a Quotient Property of Exponents?

The power of a quotient is equal to the quotient obtained when the numerator and denominator are each raised to the indicated power separately, before the division is performed.
In symbols,

$$\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$$

Thank you for watching.