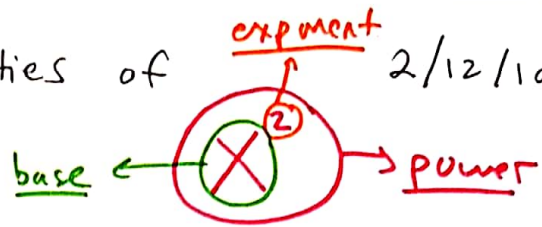


objective: to apply properties of exponents. 2/12/19



1.) Product of powers: Multiply two powers with same base.

$$5^3 \cdot 5^2 = 5^{3+2} = 5^5$$

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

Add exponents

2.) Power of a power: Two exponents side-by-side.

$$(6^2)^4 = 6^{2 \cdot 4} = 6^8$$

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

Multiply Exponents

3.) Quotient of Powers: Fractions with powers of the same base.

$$\frac{2^4}{2^2} = 2^{4-2} = 2^2$$

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

subtract Exponents

4.) Power of a product: Exponent of a multiplication problem.

$$(2x)^3 = 2^3 x^3 = 8x^3$$

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

Distribute to all parts of product

$$\star (4x^3)^2 = 4^2 x^6 = 16x^6$$

5.) Power of a quotient: Exponent of a fraction.

$$\left(\frac{x}{z}\right)^3 = \frac{x^3}{z^3} = \frac{x^3}{8}$$

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

Distribute to numerator and denominator

6.) Zero Exponent property:

$$2^0 = 1$$

Anything to the zero exponent always equals 1.

$$2^3 = 8$$

$$2^2 = 4$$

$$2^1 = 2$$

$$2^0 = 1$$

$$2^{-1} = \frac{1}{2}$$

$$2^{-2} = \frac{1}{4}$$

$$2^{-3} = \frac{1}{8}$$

7.) Negative Exponent property: Negative Exponents.

\* Goal is to turn negative exponents into positive exponents.

$$x^{-2} = \frac{1}{x^2}$$

flip to make exponents positive

$$\frac{1}{x^{-2}} = x^2$$

$$2^{-4} = \frac{1}{2^4} = \frac{1}{16}$$

a.)  $x^3 x^4 = x^7$

b.)  $x^{-3} x^2 x^0 = x^{-3+2+0} = x^{-1}$

e.)  $(-3xyz)^0 = 1$

c.)  $(2x^3)^5 = 2^5 x^{15} = 32x^{15} = \frac{1}{x^1}$

d.)  $\left(\frac{3x^2}{4y}\right)^3 = \frac{3^3 x^6}{4^3 y^3} = \frac{27x^6}{64y^3}$