

Algebra 0507Exponents**Product of Powers**

Words: when the bases are multiplied, add the exponents

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

Example: $3^4 \cdot 3^2 = 3^6$ $(x^4 y)(x y^3) = x^5 y^4$

Powers of Powers

Words: when a power is raised to a power, multiply exponents

Formula: $(a^m)^n = a^{mn}$

Example: $(3^2)^3 = 3^6$ $(x y^2)^3 = x^3 y^6$

Negative Exponents

Words: use the idea of "reciprocal": any #/variable w/ negative exponent moves to opposite side of $\div$ bar, gets $\oplus$ exponent

Formula: $a^{-m} = \frac{1}{a^m}$ $\frac{1}{a^{-m}} = a^m$

Example: $6^{-2} = \frac{1}{6^2} = \frac{1}{36}$ $\frac{x^{-2}}{y^{-3}} = \frac{y^3}{x^2}$ $\frac{x^2}{y^{-2}} = x^2 y^2$

Quotients

Words: when dividing bases, subtract exponents

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

Example: $\frac{2^4}{2} = 2^{4-1} = 2^3 = 8$ $\frac{x^6}{x^4} = x^{6-4} = x^2$

Powers of Quotients

Words: raise every base inside the () to the power!

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

Example: $\left(\frac{3}{4}\right)^2 = \frac{9}{16}$ $\left(\frac{a^2 c}{g^4}\right)^3 = \frac{a^6 c^3}{g^{12}}$

Create an Example

Anything to the 0 power equals 1

Anything to the 1st power equals itself

A negative power tells you to do what?

1. FLIP to other side of $\div$ bar

2. CHANGE exponent to positive $\rightarrow$ same number $\frac{1}{a}$

With a product of powers add the exponents.

With a quotient of powers subtract the exponents.

With a power to a power multiply the exponents.