

Properties of Exponents

UVU Math Lab

MADSPM ZONF!

Product of Powers:

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

M - multiplying factors

A - add exponents

$$(4xy^2)(3y^3x^3) = 12x^4y^5$$

Quotient of Powers:

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

D - dividing factors

S - subtract exponents

$$\frac{12p^7r^3}{4r^4p^5} = \frac{3p^2}{r}$$

Power of a Power:

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

P - power to a power

M - multiply exponents

$$\left(\frac{s^4}{t^2}\right)^3 = \frac{s^{12}}{t^6}$$

Zero Power:

$$a^0 = 1$$

Z - zero power

O - equals 1

$$\left(\frac{7^2a^3bc^{14}}{-7abc^8}\right)^0 = 1$$

Negative Power:

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

N - negative power

F - flip

$$\frac{12a^2}{3b^{-2}} = 4a^2b^2$$

Properties of Roots

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Property:	Example:
Multiplication Property of Roots: $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$	$\sqrt[3]{3x} \cdot \sqrt[3]{4x} = \sqrt[3]{12x^2}$
Division Property of Roots: $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$	$\sqrt[3]{\frac{24}{27}} = \frac{\sqrt[3]{24}}{\sqrt[3]{27}} = \frac{2\sqrt[3]{12}}{3}$
Addition-Subtraction Property of Roots: $a^n\sqrt[n]{c} \pm b^n\sqrt[n]{c} = (a \pm b)^n\sqrt[n]{c}$	$2^3\sqrt[3]{3} - 3\sqrt[3]{3} = \sqrt[3]{3}$
Definition of Rational Exponents: $\sqrt[n]{a^m} = a^{\frac{m}{n}}$	$\sqrt{4} = 4^{1/2}$
