

## Exponent Rules

eq: How can we use exponent rules to simplify complex math problems in algebra?

Name 3 common rules.

means multiply

means divide

How do you do the negative exponent?

always one

Explain the steps of the fractional exponent.

Name	Rule	Examples
Product Rule	$a^m \cdot a^n = a^{m+n}$	$3^2 \cdot 3^3 = 3^5$
Quotient Rule	$\frac{a^m}{a^n} = a^{m-n}$	$\frac{5^4}{5^2} = 5^{4-2} = 5^2$
Power Rule	$(a^m)^n = a^{m \cdot n}$	$(4^2)^5 = 4^{2 \cdot 5} = 4^{10}$
Power of a Product	$(a \cdot b)^m = a^m \cdot b^m$	$(3 \cdot 5)^6 = 3^6 \cdot 5^6$ $(x^2 \cdot y^2)^6 = x^{12} \cdot y^{12}$
Zero Exponent	$a^0 = 1$	$1002^0 = 1; (x^2)^0 = 1$
Negative Exponent	$a^{-n} = \frac{1}{a^n}$	$5^{-2} = \frac{1}{5^2} = \frac{1}{25}$
Fractional exponent	$a^{\frac{m}{n}} = \sqrt[n]{a^m}$	$4^{\frac{2}{3}} = \sqrt[3]{4^2} = \sqrt[3]{16}$

We could use exponent rules to simplify complex problems by using the rules and practicing how to do them w/o looking at the chart. For example, remembering that anything times 0 will be 1.