

Rules for Exponents

The Product Rules for Exponents

For all real numbers x and y and real number constants m and n

1. $x^m x^n = x^{m+n}$ The Product Rule
2. $(x^m)^n = x^{m \times n}$ The Power Rule
3. $(xy)^m = x^m y^m$ The Power of a Product Rule

The Quotient Rules for Exponents

For all real numbers x and y and real number constants m and n

4. $\frac{x^m}{x^n} = x^{m-n}$ or $\frac{1}{x^{n-m}}$ ($x \neq 0$) The Quotient Rule
5. $\left(\frac{x}{y}\right)^m = \frac{x^m}{y^m}$ ($y \neq 0$) The Power of a Quotient Rule

Rules for Integer Exponents Less Than 1

For all real numbers x and y and real number constants m

6. $x^0 = 1$ ($x \neq 0$) Zero-Exponent Rule
7. $x^{-m} = \frac{1}{x^m}$ and $\frac{1}{x^{-m}} = x^m$ ($x \neq 0$) Negative Exponent Rule

