

Rules and definitions of exponents

The product rule of exponents: $a^m \cdot a^n = a^{m+n}$

The quotient rules of exponents: $\frac{a^m}{a^n} = a^{m-n}$ and $\frac{a^m}{a^n} = \frac{1}{a^{n-m}}$ (Note that $a \neq 0$.)

The power to a power rule: $(a^m)^n = a^{mn}$

The product to a power rule: $(ab)^m = a^m b^m$

The quotient to a power rule: $\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$ (Note that $b \neq 0$.)

Zero exponents: $b^0 = 1$, $b \neq 0$

Negative exponents: $a^{-n} = \frac{1}{a^n}$ (Note that $a \neq 0$.)

Negative exponent rules: $\frac{1}{a^{-n}} = a^n$ and $\left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n$ (Note that $a \neq 0$ and $b \neq 0$.)