

Exponent Rules

The Rule	Why it Works	Example
When MULTIPLYING with LIKE BASES, you keep the base and add the exponents	$x^4 \cdot x^2 = \underbrace{x \cdot x \cdot x \cdot x}_{x^4} \cdot \underbrace{x \cdot x}_{x^2} = x^6$	$x^{4+2} = x^6$
When DIVIDING with LIKE BASES, you keep the base and SUBTRACT the exponents	$\frac{a^6}{a^3} = \frac{\cancel{a} \cdot \cancel{a} \cdot \cancel{a} \cdot a \cdot a \cdot a}{\cancel{a} \cdot \cancel{a} \cdot \cancel{a}} = \frac{a \cdot a \cdot a}{1} = a^3$	$a^{6-3} = a^3$
When RAISING A POWER TO A POWER, you MULTIPLY the exponents	$(b^2)^3 = (b \cdot b) \cdot (b \cdot b) \cdot (b \cdot b) = b^6$	$b^{2 \cdot 3} = b^6$
When you have a NEGATIVE exponent, you make it a fraction, flip it, and make the exponent POSITIVE.	$c^{-4} = \frac{1}{c^4}$	$\frac{a^{-2}}{b^3} = \frac{1}{a^2 b^3}$
When you have ZERO as an exponent, the answer is 1! ALWAYS	$a^0 = 1$	$7, 201^0 = 1$