

EXPONENT RULES

Rule	Example
1) $a^m \cdot a^n = a^{m+n}$	$2^3 \cdot 2^4 = 2^{3+4} = 2^7$
2) $(a^m)^n = a^{m \cdot n}$	$(2^3)^4 = 2^{3 \cdot 4} = 2^{12}$
3) $(a^m b^n)^p = a^{m \cdot p} b^{n \cdot p}$	$(a^3 b^4)^5 = a^{3 \cdot 5} b^{4 \cdot 5} = a^{15} b^{20}$
4) $\frac{a^m}{a^n} = a^{m-n}$	$\frac{2^5}{2^3} = 2^{5-3} = 2^2$
5) $a^0 = 1$	$5^0 = 1$
6) $a^{-1} = \frac{a^{-1}}{1} = \frac{1}{a^1}$	$5^{-1} = \frac{5^{-1}}{1} = \frac{1}{5}$
7) $\frac{1}{a^{-1}} = \frac{a^1}{1} = a$	$\frac{1}{5^{-1}} = \frac{5^1}{1} = 5$
8) $a^{-m} = \frac{a^{-m}}{1} = \frac{1}{a^m}$	$2^{-3} = \frac{1}{2^3} = \frac{1}{8}$
9) $\frac{1}{a^{-m}} = \frac{a^m}{1} = a^m$	$\frac{1}{2^{-3}} = \frac{2^3}{1} = 2^3 = 8$
10) $\left(\frac{a^m b^n}{c^p}\right)^q = \frac{a^{mq} b^{nq}}{c^{pq}}$	$\left(\frac{a^2 b^3}{c^4}\right)^5 = \frac{a^{2 \cdot 5} b^{3 \cdot 5}}{c^{4 \cdot 5}} = \frac{a^{10} b^{15}}{c^{20}}$

Please note: for rules 4 - 9, $a \neq 0$, and for rule 10, $c \neq 0$