

EXPONENT RULES

DEFINITION	EXPONENT RULES	EXAMPLES
PRODUCT RULE	$X^M \times X^N = X^{M+N}$	$7^4 \times 7^6 = 7^{10}$
ZERO EXPONENT	$X^0 = 1$ $-X^0 = -1$	$(-4)^0 = 1$ $-4^0 = -1$
NEGATIVE EXPONENT	$X^{-M} = \frac{1}{X^M}$	$5^{-3} = \frac{1}{5^3} = \frac{1}{125}$
QUOTIENT RULE	$\frac{X^M}{X^N} = X^{M-N}$	$\frac{3^2}{3^4} = 3^{2-4} = 3^{-2} = \frac{1}{3^2} = \frac{1}{9}$
POWER RULES	$(X^M)^N = X^{M \times N}$	$(4^3)^4 = 4^{3 \times 4} = 4^{12}$
	$(XY)^N = X^N \times Y^N$	$(3x)^4 = 3^4 \times x^4 = 81x^4$
	$\left(\frac{X}{Y}\right)^M = \frac{X^M}{Y^M}$	$\left(\frac{2}{3}\right)^2 = \frac{2^2}{3^2} = \frac{4}{9}$
NEGATIVE-TO-POSITIVE RULES	$\frac{X^{-M}}{Y^{-N}} = \frac{Y^N}{X^M}$	$\frac{6^{-2}}{5^{-3}} = \frac{5^3}{6^2} = \frac{125}{36}$
	$\left(\frac{X}{Y}\right)^{-M} = \left(\frac{Y}{X}\right)^M$	$\left(\frac{5}{7}\right)^{-2} = \left(\frac{7}{5}\right)^2 = \frac{49}{25}$