



Exponent Rules



ZERO POWER RULE

$$X^0 = 1$$

ANYTHING raised to the zero power equals 1

EXAMPLE $(5a)^0 = 1$

PRODUCT RULE

$$X^a \cdot X^b = X^{a+b}$$

when multiplying terms with the SAME BASE, add the exponents

EXAMPLE $2^3 \cdot 2^4 = 2^7$

QUOTIENT RULE

$$\frac{X^a}{X^b} = X^{a-b}$$

when dividing terms with the SAME BASE, subtract the exponents

EXAMPLE

$$\frac{8^7}{8^4} = 8^3$$

POWER TO POWER

$$(X^a)^b = X^{a \cdot b}$$

when raising a power to a power, multiply the exponents

EXAMPLE $(3^2)^4 = 3^8$

POWER OF PRODUCTS

$$(xy)^a = x^a \cdot y^a$$

when raising a product to a power, apply the exponent to EACH FACTOR

EXAMPLE $(5a)^2 = 5^2 \cdot a^2$

NEGATIVE EXPONENTS

$$X^{-a} = \frac{1}{X^a}$$

to make a negative exponent positive, move it to the other "side" of the fraction

EXAMPLE $\frac{1}{4^{-2}} = 4^2$