Product of Powers

Power of a Power

Power of a Product

Negative Exponent

Zero Exponent

Quotient of Powers

Power of a Quotient

Examples with Multiple Properties

1. $\dfrac{(x^5y^2)^3}{x^{15}y^8}$ $\quad \dfrac{x^{15}y^6}{x^{15}y^8}$

$x^{15-15}\,y^{6-8} = y^{-2} = \boxed{\dfrac{1}{y^2}}$

2. $\left(\dfrac{a^{-4}}{b^2}\right)^2$ $\quad \dfrac{a^{-4\cdot 2}}{b^{2\cdot 2}} = \dfrac{a^{-8}}{b^4}$ $\boxed{\dfrac{1}{a^8b^4}}$

3. $\left(\dfrac{-2a^2b}{a^5b}\right)^3 = \dfrac{-2^3a^{2\cdot 3}b^3}{a^{5\cdot 3}b^3}$

a^6 $\quad a^{15}$

$-8a^{6-15}$

$-8a^{-9} = \boxed{\dfrac{-8}{a^9}}$

Scientific Notation: $a \times 10^b$

between 1 & 10, ≠10

- Negative exponent ← move the decimal
- Positive exponent → move the decimal

Operations with Scientific Notation:

Multiply:

85,000,000 x 1200

$(8.5 \times 10^7)(1.2 \times 10^3)$

10.2×10^{10}

$\boxed{1.02 \times 10^{11}}$

Divide:

$\dfrac{1.1 \times 10^{-3}}{5.5 \times 10^{-8}}$ $\quad -3-{-8}$

$.2 \times 10^5$

$\boxed{2 \times 10^4}$

$a^m \cdot a^n =$ a^{m+n}

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

$(a^m)^n =$ a^{mn}

$(5^2)^6 = 5^{12}$

$5^2 \cdot 5^2 \cdot 5^2 \cdot 5^2 \cdot 5^2 \cdot 5^2$

$(a \cdot b)^m =$ $a^m b^m$

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

$a^{-m} =$ $\frac{1}{a^m}$ $a \neq 0$

$4^{-2} = \frac{1}{4^2} = \frac{1}{16}$

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

$\frac{1}{4^{-2}} = 4^2 = 16$

$a^0 =$ 1 $a \neq 0$

$(5x^2y^3z^1)^0 = 1$

$\frac{a^m}{a^n} =$ a^{m-n} $a \neq 0$

$\frac{2^3}{2^2} = 2^{3-2} = 2^1 = 2$

$\left(\frac{a}{b}\right)^m =$ $\frac{a^m}{b^m}$ $b \neq 0$

$\left(\frac{3}{2}\right)^4 = \frac{3^4}{2^4}$