

EXPONENT LAWS

Law of Multiplication

When multiplying powers with the same base, keep the base and add the exponents.

$$x^2 \cdot x^3 = x^5$$

→ Multiply any coefficients normally.

$$6x^2 \cdot 3x^3 = 18x^5$$

→ When there is more than one variable, group common variables together and multiply.

$$6x^2y^3 \cdot 3x^3y^{-1} = 18x^5y^2$$

→ **Common Mistake:** There are no rules for addition. Evaluate any power individually.

$$2^3 + 2^2 \neq 2^5 = 32$$

Wrong Answer

$$2^3 + 2^2 = 8 + 4 = 12$$

Right Answer

Law of Division

When dividing powers with the same base, keep the base and subtract the exponents.

$$\frac{x^5}{x^2} = x^3$$

→ If the exponent in the denominator term is higher, place the answer in the denominator. A 1 should be written if the numerator is left blank.

$$\frac{x^2}{x^5} = \frac{1}{x^3}$$

→ Reduce any coefficients similar to the way you would reduce fractions:

$$\frac{12x^2}{16x^5} = \frac{3}{4x^3}$$

A **power** consists of a **base** and an **exponent**.

For the power:

$$x^2$$

x is the base and
2 is the exponent.



→ When there is more than one variable, group common variables together and divide.

$$\frac{12x^2y^{-3}}{16x^5y^{-5}} = \frac{3y^2}{4x^3}$$

→ If the exponents are equal on two powers with the same base, the powers will cancel each other out or reduce to 1.

$$\frac{12x^2y^{-3}z^4}{16x^5y^{-5}z^4} = \frac{3y^2}{4x^3}$$

Law of Powers

If a power is raised to a higher exponent, keep the base and multiply the exponents.

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

Law of Zero Exponents

Any base raised to a zero exponent is 1.

$$x^0 = 1$$

