

## Exponent Rules

### The Product Rule for Exponents (Multiplying Like Bases With Exponents)

When you multiply like bases you add your exponents.

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

$$2^3 \cdot 2^5 = 2^{3+5} = 2^8$$

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

### Quotient Rule for Exponents (Dividing Like Bases With Exponents)

When you divide like bases you subtract their exponents.

$$a^m \div a^n = a^{m-n}$$

$$7^5 \div 7^2 = 7^{5-2} = 7^3$$

$$2^2 \div 2^5 = 2^{2-5} = 2^{-3} = \frac{1}{2^3} = \frac{1}{8}$$

### Power of a Power Rule for Exponents (Base Raised to Two Exponents)

When you raise a base to two exponents, you multiply those exponents together.

$$(a^m)^n = a^{m \times n}$$

$$(a^5)^2 = a^{5 \times 2} = a^{10}$$

$$(2^2)^{-3} = 2^{2 \times -3} = 2^{-6} = \frac{1}{2^6} = \frac{1}{64}$$