



Laws of exponents

The two rules

Multiply Add the powers.

$$x^3 \times x^2 = (xxx)(xx) = x^5$$

Divide Subtract the powers.

$$x^5 \div x^2 = xxxxx \div xx = x^3$$

Same base Or neither rule applies.

$$x^3 \times y^2 \text{ stays as it is}$$

A power of a power

$(x^3)^2$ Multiply the powers.

$$x^3 \times x^3 = x^6$$

$(2x)^3$ Every factor takes it.

$$2^3 \times x^3 = 8x^3$$

Zero, minus, fraction

x^0 Always 1.

$$x^3 \div x^3 = 1$$

x^{-3} Flip it over.

$$x^2 \div x^5 = 1/x^3$$

9 to the $\frac{1}{2}$ The square root.

$$\sqrt{9} = 3$$

Not this — this

$x^3 + x^3$ is not x^6 .

$$= 2x^3$$

$x^3 \times y^2$ will not combine.

different bases

$(2x)^3$ is not $2x^3$.

$$= 8x^3, \text{ eight times bigger}$$

x^{-3} is not negative.

$$= 1/x^3, \text{ small and positive}$$