

Zero and Negative Exponents

8th Grade

Why anything to the power zero is one, and where a negative one lives.

Any non-zero base to the power zero is 1. A negative exponent means the reciprocal — move it to the other side of the fraction line.

$$a^0 = 1 \cdot a^{-n} = 1/a^n$$

$$5^0$$

$$1$$

Follows from $x^3 \div x^3 = x^0$ and also = 1.

$$2^{-3}$$

$$1/8$$

Move it to the denominator, then evaluate.

$$1/x^{-2}$$

$$x^2$$

It moves the other way too.

$$(2/3)^{-1}$$

$$3/2$$

A negative exponent flips a fraction.

THE COMMON MISTAKE

$$\times 2^{-3} = -8$$

$$\checkmark 2^{-3} = 1/8$$

The minus is about position, not sign. The answer is positive and small.

0^0 is undefined. Every other base to the power zero is exactly 1.