# Math 9

## Rules of exponents!

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## Base:

A number in an equation that is being multiplied by itself.

*Ex.*
***X***^2

## Exponent:

the number of times the base is multiplied by itself.

Ex.
X^**2**

## Product rule:

multiplication question, you add 2 or more exponents with the same base together.

Ex. x^c * x^m = x^m+c

2^3 * 2^2 = 2^3+2 = 2^5 = 32

## Quotient rule:

the opposite of the product rule, but instead of adding, you subtract the 2 or more exponents with the same base.

Ex.  x^m / x^n = x^m-n

2^4 / 2^1 = 2^3 = 8

## Power to power rule:

The power-to-power rule is when you multiply the 2 or more exponents.

Ex.  (x^m) ^n

(2^3) ^2 = (8)^2 =64

## Zero exponent rule:

You may be wondering what happened if the exponent is a 0, Well it must be 0 right? Wrong, It will always equal 1 this is because if we look at the pattern, you divide 3 each time. When you divide a number that's not 0 then it will never equal 0.

| Power | Value |
|---|---|
| $3^3$ | 27 |
| $3^2$ | 9 |
| $3^1$ | 3 |
| $3^0$ | 1 |

## Negative exponent rule:

When the exponent is negative, to simplify, Turn it into a fraction with the variable and the exponent at the bottom (since x^-m = x^-m/1)

Ex.  x^-n = 1/x^n

2^-4 = 1^24

## One exponent rule:

Any base with the exponent as 1 will always equal the base.

Ex. x^1 = x  2^1 = 2

***Source*** • My brain (and mrs bennett's teaching)