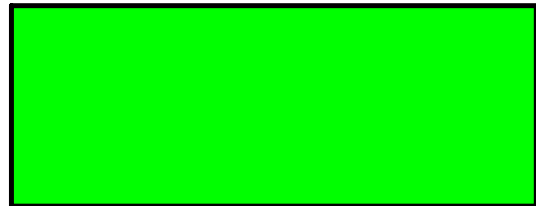


$$2^1 \times 2^1 \times 2^1 \times 2^1 = 2^4$$



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

$$4^2 \times 4^3 \times 4^4 = 4^9$$

Multiplying Exponents Rule

- Base numbers must be the same!
- Add the exponents

Examples

1.) $10^2 \times 10^4 =$ _____

$$10 \times 10 \times 10 \times 10 \times 10 \times 10$$

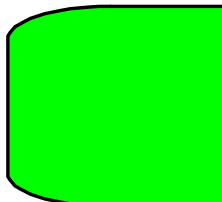
2.) $b^3 \times b^5 =$ _____

$$b \times b \times b \times b \times b \times b \times b \times b$$



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

$\frac{25^2}{5}$

And since we know that: $\frac{5}{5} = 1$ 

$5 - 3 = 2$

We can start simplifying

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

So now this can turn into: $\frac{5^2}{1} = 5^2$

Dividing Exponents Rule

- Base numbers must be the same!
- Subtract the exponents

Examples:

$$\frac{4^6}{4^2} = \frac{4 \times 4 \times 4 \times 4 \times 4 \times 4}{4 \times 4} = \frac{4^4}{1} = 4^4$$

$$\frac{n^3}{n^5} = \frac{n \times n \times n}{n \times n \times n \times n \times n} = \frac{n^3}{n^5} = \frac{1}{n^2}$$

Powers

- When an exponent is raised to another exponent.
- Multiply the exponents

Examples:

1.) $(10^3)^4 =$ _____

2.) $(b^2)^5 =$ _____

Challenge!!

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

$$\frac{(12^8)}{(12^4)} =$$

.

Pattern:

$$4^3 = 4 \times 4 \times 4 = 64$$

$$4^2 = 4 \times 4 = 16$$

$$4^1 = 4$$

$$4^0 = 1$$

$$\begin{array}{r} 2 \\ 16 \\ \times 4 \\ \hline 64 \end{array}$$

Power of Zero

When any number (other than zero) has an exponent of zero, the answer is always one.

Examples:

$$5^0 = 1$$

$$60,597^0 = 1$$

To the Power of 0

The rule states that any number to the power of zero is equal to one. This is because of the laws of exponents.

$$\frac{a^2}{a^2} = a^{2-2} = a^0 \text{ or } 1$$

because any number divided by itself is 1.