## Class Notes on The Exponent Rules

What is a POWER?
When it comes to mathematics, we refer to a power as an exponential expression used for indicating the numbers of factors involved in multiplication.

There are special rules for powers that will make solving questions in this course easier if we apply them correctly. You may have been exposed to these rules way back in the day....

## REMEMBER:

"ben" FOR EXPONENTS


What is a BASE?
The base is the number that gets multiplied.

What is an EXPONENT?

The exponent is the number that tells you the number of times to multiply the base.

## The Exponent Rules

## Rule \#1: Multiplying Powers with the Same Base

When multiplying powers with the same base you ADD the exponents.

$$
\text { Example: } a^{3} x a^{2}=a^{3+2}=a^{5}
$$

## Rule \#2: Dividing Powers with the Same Base

When dividing powers with the same base you SUBTRACT the exponents.

$$
\text { Example: } a^{5} \div a^{3}=a^{5-3}=a^{2}
$$

## Rule \#3: When Raising Powers to Another Power

When raising a power to another power you MULTIPLY the exponents.

$$
\text { Example: }\left(a^{4}\right)^{2}=a^{4 \times 2}=a^{8}
$$

## Rule \#4: Powers with a Negative Exponent

Powers with a negative exponent can be written as a FRACTION with a POSITIVE exponent.

$$
\text { Example: } a^{-5}=\frac{1}{a^{5}}
$$

Conversely, a fraction whose denominator has an exponent can be written as a power with a NEGATIVE exponent.

$$
\text { Example: } \frac{1}{a^{9}}=\boldsymbol{a}^{-9}
$$

## Rule \#5: A Power with an Exponent of One

When evaluating a power with an exponent of one, the answer will be the base.

$$
\text { Example: } \mathbf{a}^{1}=\mathbf{a}
$$

Rule \#6: A Power with an Exponent of Zero
When evaluating a power with an exponent of zero, the answer will be one.
Example: $a^{0}=1$

