Notes: Exponent Laws   Name: _____

Exponent: An exponent refers to the number of times that a number is multiplied by itself.

- Example - $2 \cdot 2 \cdot 2 = 2^3$

  - 2 is called the **base** of the exponent
  - 3 is called the **power** of the exponent

$$b^x$$

Base ⟶ Power

Multiplying Like Bases:	Dividing Like Bases:
• Rule: $b^x \cdot b^y = b^{(x+y)}$ • Example: $3^2 \cdot 3^4 = 3^{(2+4)} = 3^6$	• Rule: $\dfrac{b^x}{b^y} = b^{(x-y)}$ • Example: $\dfrac{x^5}{x^2} = x^{(5-2)} = x^3$
Zero Power: • Rule: $\dfrac{b^x}{b^x} = b^0 = 1$ • Example: $\dfrac{3^5}{3^5} = 3^{(5-5)} = 3^0 = 1$ • Anything raised to the zero power is 1.	**Power of a Power:** • Rule: $(b^x)^y = b^{x \cdot y}$ • Example: $(m^2)^4 = m^{(2 \cdot 4)} = m^8$
Power of a Quotient: • Rule: $\left(\dfrac{a^x}{b^y}\right)^m = \dfrac{a^{mx}}{b^{mx}}$ • Example: $\left(\dfrac{p^3}{3^5}\right)^2 = \dfrac{p^{2 \cdot 3}}{3^{2 \cdot 5}} = \dfrac{p^6}{3^{10}}$	**Negative Exponents:** • Rule: $\dfrac{1}{b^{-x}} = b^x$ and $b^{-x} = \dfrac{1}{b^x}$ • Example: $\dfrac{1}{n^{-3}} = n^3$ and $2^{-5} = \dfrac{1}{2^5}$