Math 2 – Honors
Rule of Exponents

RULE	EXAMPLE	EXPLANANTION
$a^m \cdot a^n = a^{m+n}$	A) $x^2 \cdot x^6 =$ x^8 B) $x^4y^8x^3yz^2 =$ $x^7y^9z^2$	When **multiplying** with **like bases**, keep the base and add the exponents.
$\frac{a^m}{a^n} = a^{m-n}$ OR $\frac{a^n}{a^m} = \frac{1}{a^{m-n}}$ $m > n$	A) $\frac{x^8}{x^3} =$ x^5 B) $\frac{x^2y^5}{x^7y^6} =$ $\frac{1}{x^5y}$	When **dividing** with **like bases**, keep the base and subtract the exponents.
$(a^m)^n = a^{mn}$	A) $(x^5)^3 =$ x^{15}	**Power to a Power** – keep the base and multiply the exponents.
$(ab)^m = a^m b^m$	A) $(x^5y^3)^3 =$ $x^{15}y^9$ B) $(2x^3z^4)^4 =$ $2^4x^{12}z^{16}$	**Power to a Product** – Raise everything in the parentheses to the power.
$\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$	A) $\left(\frac{x^2}{y^4}\right)^2 =$ $\frac{x^4}{y^8}$ B) $\left(\frac{3x^4y^5}{4x^2y^7}\right)^3 =$ $\frac{27x^{12}y^{15}}{64x^6y^{21}}$	**Power to a Quotient** – Raise everything in the parentheses to the power.
$a^{-m} = \frac{1}{a^m}$ OR $\frac{1}{a^{-m}} = a^m$	A) $\frac{x^2y^{-3}}{z^{-5}x^6} =$ $\frac{z^5}{y^3x^4}$ B) $\frac{2x^{-4}}{3y^{-2}} =$ $\frac{2y^2}{3x^4}$	Change a **negative exponent** to a **positive exponent** by moving the base to either the denominator or the numerator of a fraction.
$b^0 = 1$	A) $(2x^4)^0 =$ 1 B) $3x^0y^5 =$ 1	Any base raised to the **zero** power equals **1**.
Never leave a NEGATIVE EXPONENT or a ZERO EXPONENT in an answer in simplest form!!!!!		

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