Exponent Rules Review Worksheet

<u>NOTE:</u> Anything to the zero power equals 1!

<u>Product Rule:</u> When multiplying monomials that have the same base, add the exponents.

$$x^m \cdot x^n = x^{m+n}$$

Example 1: $x \cdot x^3 \cdot x^4 = x^{1+3+4} = x^8$

Example 2: $(2x^2 y)(-3x^3 y^4) = 2 \cdot (-3) \cdot x^2 \cdot x^3 \cdot y \cdot y^4 = -6x^5 y^5$

<u>Power Rule:</u> When raising monomials to powers, multiply the exponents.

$$\left(x^m\right)^n = x^{m \cdot n}$$

Example 3: $(x^2 y^3)^4 = x^{2 \bullet 4} y^{3 \bullet 4} = x^8 y^{12}$

Example 4: $(2x^3 yz^2)^3 = 2^3 x^{3 \bullet 3} y^3 z^{2 \bullet 3} = 8x^9 y^3 z^6$

<u>Quotient Rule:</u> When dividing monomials that have the same base, subtract the exponents.

$$\frac{x^m}{x^n} = x^{m-n}$$

Example 5: $\dfrac{x^3}{x^{-2}} = x^{3-(-2)} = x^5$

Example 6: $\dfrac{5^6}{5^2} = 5^{6-2} = 5^4$

Example 7: $\dfrac{36m^3 n^5}{-9mn^4} = \dfrac{36}{-9} \cdot \dfrac{m^3}{m} \cdot \dfrac{n^5}{n^4} = -4m^2 n$