Section 11-2:
Multiplying Variables with Exponents

Objectives:

- To multiply variables together that contain exponents.
- To evaluate an exponent raised to another exponent.
- To know what it means to have an exponent of zero.

Ex 1: $3^2 \cdot 3^4 = 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 = 3^6$

$= 729$

Ex 2: $x^4 \cdot x^5 = x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x$

$= x^9$

Rule #1: When multiplying variables with exponents, ADD the exponents.

(Bases must match.)

Ex 3:

$3x^3 \cdot 4x^2$

$3 \cdot x \cdot x \cdot x \cdot 4 \cdot x \cdot x$

$12x^5$

$3x^3 \cdot 4x^2y^5$

$12x^5y^5$

***Multiply whole #'s together, put them in front, then write variables alphabetically in exponential form.**

$4+1+3=8$

Ex 4: $w^4 \cdot w^1 \cdot w^3 = w^8$

$3+2=5$

Ex 5: $(x^3)(y^4)(x^2) = x^5 y^4$

Ex 6: $(2^3)^2$ Multiply $\rightarrow (8)^2 = 64$

$(2^3)(2^3) = 2^6 = 64$

Ex 7: $(x^3)^2 = x^{3 \cdot 2} = x^6$

Rule #2: When an exponent is raised to another exponent, MULTIPLY the exponents.

Ex 8: $(2xy^2)^3 = 2^3 \cdot x^3 \cdot (y^2)^3 = 8x^3y^6$

$(2xy^2)\cdot(2xy^2)\cdot(2xy^2)$

$8x^3y^6$

** (Anything)^0 = 1

But 0^0 **is undefined/error.**

Ex 9: $\left(\frac{5682x^{81}y^{42}}{q^{17}p^9}\right)^0 = 1$