Warm Up

Without using notes fill in

1) Zero Rule

$(-x)^0 =$ 1

2) Product of Powers Rule

$(a)^3 \times (a)^4 =$ a^7

3) Quotient Rule

$(a)^8 \div (a)^3 =$ a^5

4) Power to a Power Rule

$(a^6)^5 =$ a^{30}

5) Power of Product Rule

$[(a^2) \times (b^4)]^6 =$ $a^{12}b^{24}$

6) Power of Quotient Rule

With a power of quotient we multiply exponents

$\left[\frac{(x)^6}{(y)^3}\right]^2 =$ $\frac{x^{12}}{y^6}$

1) $(2x^2y)^5 = 2^5 x^{10} y^5$

$= 32x^{10}y^5$

2) $\frac{15x^3y^4}{5x^1y^1} = 3x^2y^3$

3) $\frac{(3x^3y^2)^6}{(2xy)^4} = \frac{3^6 x^{18} y^{12}}{2^4 x^4 y^4}$

$= \frac{729 x^{14} y^8}{16}$

$$\frac{(4x^2y^3)^3\,(2xy^2)^2}{(2x^2y^3)^3}$$

$$\frac{(4^3x^6y^9)\,(2^2x^2y^4)}{(2^3x^6y^9)}$$

$$\frac{(64)\,x^8y^{13}\,(4)}{(8)\,x^6y^9}$$

$$32x^2y^4$$

$(3x^3y^0)^2 \quad (2xy^4)$

$3^2x^6y^0 \quad (2xy^4)$

$(9x^6y^0) \cdot (2x^1y^4)$

$18x^7y^4$

$$\frac{(3x^5y^6)^2\ (4x^2y^3)^2}{(2x^3y^2)^2}$$

$$\frac{(3^2x^{10}y^{12})\qquad(4^2x^4y^6)}{2^2x^6y^4}$$

$$\frac{(9x^{10}y^{12})\cdot(16x^4y^6)}{(4x^6y^4)}$$

$$\frac{144\,x^{14}\,y^{18}}{4\,x^6\,y^4}$$

$$\boxed{36\,x^8\,y^{14}}$$

$$\frac{(4x^5y^2)^2}{(2x^2y)^3}$$

$$\frac{x^6}{x^8} = x^{6-8} = x^{-2}$$

$$\frac{x^{-2}}{1} = \frac{1}{x^2}$$

$$3x^5y^{-2} = \frac{3x^5}{y^2}$$

Negative Exponent Law

If you have a negative exponent move it to the denominator

Example: $x^{-2} = \frac{1}{x^2}$

Example:

a) $3rx^{-5} = \frac{3r}{x^5}$

b) $2x^{-5}y^{6} = \frac{2y^6}{x^5}$

$$\frac{(2x^3)\cdot(3x^5y)}{(2x^2y^3)^2} = \frac{6x^8y^1}{4x^4y^6}$$

$$= \frac{3x^4y^{-5}}{2}$$

$$= \frac{3x^4}{2y^5}$$