Exponent Rules

May 21

1. $a^m \cdot a^n = a^{m+n}$

2. $(ab)^m = a^m \cdot b^m$

3. $(a^m)^n = a^{m \cdot n}$

4. $\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$

5. *If* $m > n$, $\frac{a^m}{a^n} = a^{m-n}$ *or* $\frac{a^n}{a^m} = \frac{1}{a^{m-n}}$

6. $a^{-m} = \frac{1}{a^m}$ *or* $\frac{1}{a^{-m}} = a^m$

7. $a^0 = 1$

examples:

1. $-2x^5y^2 \cdot 9xy^7$

$-18x^6y^9$

2. $(3x^4)^2 \cdot (5xy^2)^3$

$9x^8 \cdot 125x^3y^6$

$1125x^{11}y^6$

3. $\dfrac{315x^5y^7}{525x^9y^4}$

$\dfrac{3y^3}{5x^4}$

4. $\left(\dfrac{3x^3}{y}\right)^{-2} = \dfrac{3^{-2}x^{-6}}{y^{-2}}$

$= \dfrac{y^2}{3^2x^6} = \dfrac{y^2}{9x^6}$

5

$$\frac{7x^3y^{-5}}{14x^{-2}y^1}$$

$$\frac{x^3 \cdot x^2}{2y^1 \cdot y^5} = \frac{x^5}{2y^6}$$

6

$$\frac{4x^3y^2}{3x^2y^{-6}} \cdot \frac{9x^{-4}y^{-1}}{12x^5x^4y}$$

$$\frac{4xy^8}{3} \cdot \frac{3}{4x^9y} = \frac{x^1y^8}{x^9y^1}$$

$$\frac{y^7}{x^8}$$