

Read through this and be able to use them in class

Exponents are used to indicate powers. Their properties are listed below. Assume throughout your work that no denominator is equal to zero and that m and n are integers.

- $a^0 = 1, a \neq 0$
- $a^{-n} = \frac{1}{a^n}$
- $a^m \cdot a^n = a^{m+n}$
- $\frac{a^m}{a^n} = a^{m-n}$
- $(ab)^n = a^n b^n$
- $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$
- $(a^m)^n = a^{mn}$

EXAMPLE

Simplify and rewrite each expression using only positive exponents.

a. $(7a^2)(-2a^{-5})$

$$\begin{aligned}(7a^2)(-2a^{-5}) &= 7(-2)a^{2+(-5)} \\ &= -14a^{-3} \\ &= \frac{-14}{a^3}, \text{ or } -\frac{14}{a^3}\end{aligned}$$

b. $(-2x^{-1}y^2)^3$

$$\begin{aligned}(-2x^{-1}y^2)^3 &= (-2)^3(x^{-1})^3(y^2)^3 \\ &= -8x^{-3}y^6 \\ &= \frac{-8y^6}{x^3}, \text{ or } -\frac{8y^6}{x^3}\end{aligned}$$

c. $\frac{2ab^5c^2}{a^3bc^2}$

$$\begin{aligned}\frac{2ab^5c^2}{a^3bc^2} &= 2a^{1-3}b^{5-1}c^{2-2} \\ &= 2a^{-2}b^4c^0 \\ &= \frac{2b^4}{a^2}\end{aligned}$$