Algebra 1: Exponent Rules   **Name** _____ **Period** _____
Guided Notes & Practice

Any quantity raised to the "zero" power is _____!!!

Use the Zero Exponent Rule to simplify:

a. $7^0 =$ b. $\pi^0 =$ c. $(-5)^0 =$ d. $-5^0 =$

Properties of Exponents

The Product Rule: $x^a \cdot x^b = x^{a+b}$

Examples:

The Quotient Rule: $\frac{x^a}{x^b} = x^{a-b}$

Examples:

The Power Rule: $(x^a)^b = x^{ab}$

Examples:

Combining more than one rule….

Product to a Power:

$(2a^2 b^2 \cdot a^5)^4 =$

Quotient to a Power:

$\left(\frac{-2a^2 b^2}{3a^7 b}\right)^2 =$

Practice with Exponents

1. $(5a^2 b^3 c^4)(6a^3 b^4 c^2)$ 2. $8a^0$

3. $\left(2b^2\right)^3$ 4. $(-2x^4)^3$

5. $\left(-4a^2 b^5 c\right)^2$ 6. $\dfrac{x^6 y^4 z}{x^2 y^9 z^7}$

7. $\left(\dfrac{2a^3 b^5}{3} \right)^2$

8. $\left(\dfrac{x^5 y^2}{x^3 y^7} \right)^3$

The Negative Exponent Rule

If x is any real number other than 0 and a is a natural number,

$x^{-a} =$

Negative exponents are "unhappy." So move them up or down and they become happy ("positive"). ☺

$\dfrac{1}{x^{-a}} =$

Using the Negative Exponent Rule

1. 8^{-2}

2. $4x^{-3}$

3. $\dfrac{2x^4}{5x^{-3} y}$

4. $\dfrac{2x^{-2}}{4 y^{-3}}$

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

6. $\left(ab^{-2} c^4 \right)^{-3}$