Algebra 1: Exponent Rules – Part 2 **Name _____ Period _____**

Let's Review!

Distributive Property

Grouping symbols, such as parentheses ( ) or brackets [ ], may mean slightly different things.

a. ***In this example, what do the parentheses mean? 5 – (3 + 4)***

b. ***In this example, what do the parentheses mean? 3(x + 2)***

Fill out the table.

Product	**Repeated Multiplication**	**Rearrange the Multiplication so Like Terms are Grouped Next to Each Other**	**Power of the Form** $a^c \cdot b^c$
$(2 \cdot 3)^3$	$(2 \cdot 3) \cdot (2 \cdot 3) \cdot (2 \cdot 3)$	$2 \cdot 2 \cdot 2 \cdot 3 \cdot 3 \cdot 3$	$2^3 3^3$
$(x \cdot y)^5$			
$(3x)^4$			

In the table, what do the parentheses mean?

- Power to a Power Rule

  $\left(x^a\right)^b = x^{a \cdot b}$

  When you _____,

  _____ the _____.

  When you _____, raise

  _____ number or variable to the power.

Fill out the table.

Problem to Simplify	**First Repeated Multiplication**	**Second Repeated Multiplication**	**Power of the Form a^b**
$(2^2)^3$	$2^2 \cdot 2^2 \cdot 2^2$	$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$	2^6
$(5^3)^4$			
$(x^5)^2$			
$(3^2 y^2)^3$			

Use the Power to a Power Rule to simplify each of the following.

a. $\dfrac{(x^3)^2}{x^4}$

b. $(-2m^5)^2 \cdot m^3$

c. $(2r^{-4})^{-3}$

How does the Power to a Power Rule differ from The Product Rule?

- Negative Exponent Rule

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

If the exponent is _____, move it _____ or

_____ to make it _____.

Evaluate the first 5 exponential expressions and try to determine the pattern for the remaining 3.

2^4	2^3	2^2	2^1	2^0	2^{-1}	2^{-2}	2^{-3}

Fill out the table.

Quotient	**Repeated Multiplication**	**Answer as a Fraction**	**Use the Quotient Rule to get the Power in the Form a^b**
$\frac{2^2}{2^5}$	$\frac{2 \cdot 2}{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2}$	$\frac{1}{2^3}$	$2^{2-5} = 2^{-3}$
$\frac{a^4}{a^9}$			
$\frac{5^0}{25^4}$			
$\frac{a^4 b^5}{a^7 b^6}$			

Use the Negative Exponent Rule to simplify each of the following. Write your answer using only positive exponents.

a. $-5x^{-2}$ b. $\frac{4k^2}{8k^5}$ c. $\frac{xy^{-2}}{x^4 y^{-3}}$

What does a negative exponent mean?

How do you simplify $\frac{1}{2^{-3}}$ ***?***

- Zero Exponent Rule

  $x^0 = 1$

  Anything (except zero) raised to the _____ power = _____.

Fill out the table.

Quotient	**Use the Quotient Rule to Write in the Form** a^b	**Look at the Original Quotient. Rewrite it as Just a Number**
$\frac{2^3}{2^3}$	$2^{3-3} = 2^0 = 1$	$\frac{2^3}{2^3} = \frac{8}{8} = 1$
$\frac{x^7}{x^7}$		

Use the Zero Exponent Rule to simplify each of the following.

a. $(ab)^0$ b. $(-2)^0$ c. -2^0 d. $7x^0$