Class 3: Exponents

Objective: The objective of this class is to understand what an exponent is, along with how to rewrite an expression into one single exponent using the laws.

Outcome: I expect you to be able to explain what an exponent is, identify what law needs to be used to rewrite an expression into one single exponent, and solve.

Directions: All of the following information should be a google document through typing, screenshot, picture, etc. then shared to me via e-mail. There are more directions in each part for further clarification.

Part I: What are Exponents? (10 points)
Read the Notes and practice.

Notes:

The **exponent** of a number says **how many times** to use the number in a multiplication.

Example: 9^6 is easier to write and read then $9 \times 9 \times 9 \times 9 \times 9 \times 9$
> six is the exponent, 9 is called the base.

Example: 6^5 is easier to write and read then $6 \times 6 \times 6 \times 6 \times 6$
> 5 is the exponent, 9 is called the base.

$$a^n = a \times a \times \ldots \times a$$

Example 3: 2^9 is easier to write and read then $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$
> 2 is the exponent, 9 is called the base.

a^n tells you to multiply **a** by itself,
so there are **n** of those **a**'s:

Practice: For (1-5) write out the exponent then solve. For (6-10) simplify the exponent then

solve. Answers should be in google documents.

1. 4^2	= ?	6. 4 x 4 x 4
2. 5^4	= ?	7. 5 x 5 x 5 x 5
3. 2^4	= ?	8. 2 x 2 x 2 x 2 x 2 x 2
4. 7^2	= ?	9. 1 x 1 x 1 x 1 x 1 x 1 x 1 x 1 x 1 x 1 x 1
5. 5^3	= ?	10. 3 x 3 x 3 x 3 x 3 x 3

Part II: The Rule of Exponents (40 points- graphic organizer is 20, worksheet is 20)
**Watch the video, fill out the graphic organizer, complete the quiz with a minimum of 80% and fill out the worksheet at the end.**

Video/ Graphic Organizer: Go back to the home page and complete this submission there. Then, come back to class three and continue on.

Practice: Take this Rule of Exponents quiz for practice! Complete the quiz until you receive an 80% or above. Screen shot your result and upload it onto your google document.

Worksheet: Since I am unable to physically collect a worksheet from you, I am going to allow two options. The first option is to print out the worksheet, fill in the answer, and upload the answered worksheet (scanner, picture, fax) to the google document, or try your best to write your answer onto the google document labeling which problem you are answering with an explanation.

…. The two worksheets are on the following pages.
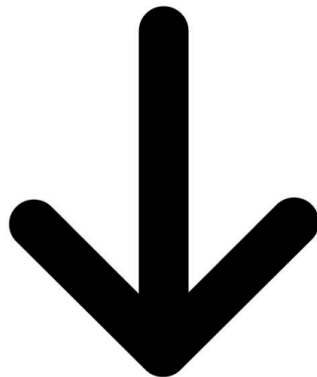
Use power rule to rewrite each expression as single positive exponent.

1) $(2^{10})^7$	2) $(19^8)^{-4}$	3) $(9^{-2})^2$
4) $(8^9)^{-3}$	5) $(17^{-7})^{-5}$	6) $(13^3)^4$

Use quotient rule to rewrite each expression as single positive exponent.

1) $14^5 \div 14^{-9}$	2) $5^{-7} \div 5^2$	3) $6^4 \div 6^{-6}$
4) $11^{-2} \div 11^{-4}$	5) $13^4 \div 13^5$	6) $8^3 \div 8^{-6}$

Use product rule to rewrite each expression as single positive exponent.

1) $4^8 \times 4^3$	2) $12^{-6} \times 12^{-10}$	3) $17^{-7} \times 17^6$
4) $3^{-5} \times 3^{-3}$	5) $7^{-2} \times 7^4$	6) $20^6 \times 20^8$

7) $(8^5)^7 \div 8^9$	8) $19^6 \times (19^4)^5$	9) $\dfrac{20^{10} \times 20^8}{20^{-9}}$
10) $(3^8)^3 \times 3^5 \times 3^{-4}$	11) $\dfrac{3^{-5}}{3^{-4} \times 3^{-10}}$	12) $(6^5)^{-9} \div (6^7)^{-8}$

Use laws of exponents to rewrite each expression as single positive exponent:

1) $\dfrac{18^4 \times 18^5}{18^6}$	2) $((-9)^3)^4 \times (-9)^6$	3) $(11^{-4})^3 \div (11^6)^{-5}$
4) $((-7)^4)^8 \div (-7)^9$	5) $\dfrac{13^7 \times 13^8}{13^{-8}}$	6) $((-13)^2)^6 \times (-13)^{-7}$

Congratulations you have finished class three!