Exponents and Logarithms Unit Portfolio

Things you should know to be successful with the portfolio and the test:

- Instructions for completing: 1. Make a copy of the portfolio 2. Answer all questions and upload artifacts (evidence) 3. Upload to your DP 4. Submit the link on EDMODO for the Exponents and Logarithm Unit Portfolio
- 20 Total Points - 4 points per section
- **Due Thursday February 9th**
- **In-class/take home test on Friday February 10th**
- Link to assignments and notes

Part 1: Unit Summary

Learning Statement

Tell the story of how you made sense of the different concepts throughout this unit. Be sure to hit all of the following talking points, and include all activities/worksheets that are applicable. ***You must use artifacts (worksheet, turn-in assignments, notes, class discussions) from this unit as evidence.***

Applying and using exponential growth and decay (4 points)

a. Describe how you made sense of the exponential form $y = ab^x$
b. Describe how you made sense of growth and decay rate
   i. $b = 1 + r$
   ii. $b = 1 - r$

Compounding interest (4 points)

c. Describe how you made sense of compounding interest and simple interest?
d. Describe how you made sense of compounding interest and continuously compounding interest?
e. Describe how e (Euler's Number) can be found using the following formula $(1 + \frac{1}{n})^n$ (Hint: Start with n = 1 and keep getting bigger 10, 100, 1000, etc) What is happening as n gets bigger? *

Solving for exponents in equations (4 points)

f. Describe how you made sense of solving for exponents in equations when the bases can be made the same.
g. Describe how you made sense of solving for exponents in equations when the bases are not the same. (Hint: Look at your definition of a Logarithm Notes)

Logarithms (4 points)

h. Describe how you made sense of converting between the logarithmic and exponential form of an equation.
i. Describe how you made sense of the Log Properties.

Part 1: Unit Summary Answers Here

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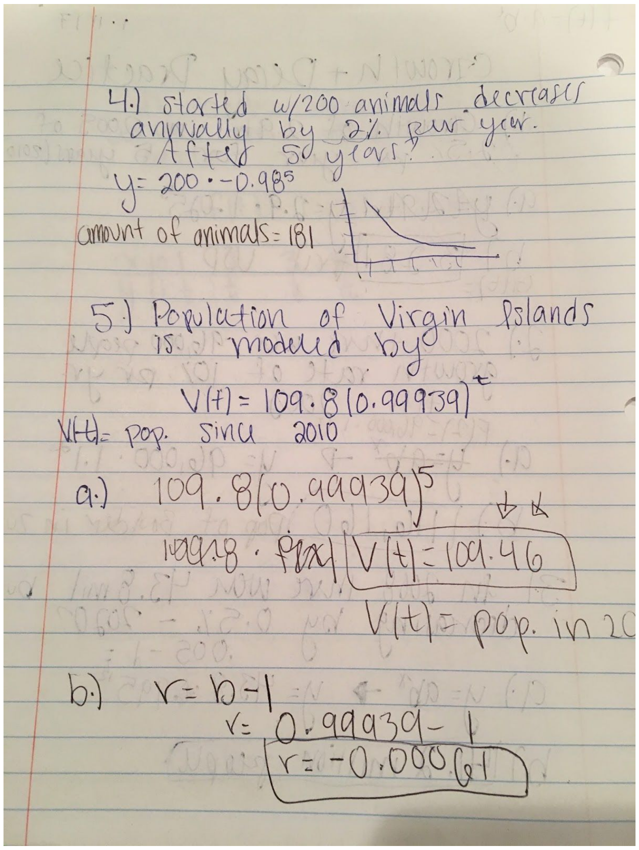
<tr><th>Beautiful examples (Your assignment work here! Evidence)</th><th>Amazing Narratives</th></tr>
<tr><td>
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1. Applying and using exponential growth and decay

The exponential growth and decay equation came to me relatively easy. It is really simple when you think about it and all the variables come together flawlessly. Once I memorized what each variable represents it was easy to put everything together and use it in a real life situation.

y=ab^x means amount=initial amount(rate)^time

Depending on if the exponential rate is decaying or growing by a percentage, we add 1 or subtract the rate from 1 using the equations:

b=1+r and b=1-r

This affects the rate at which the amount grows or decays.
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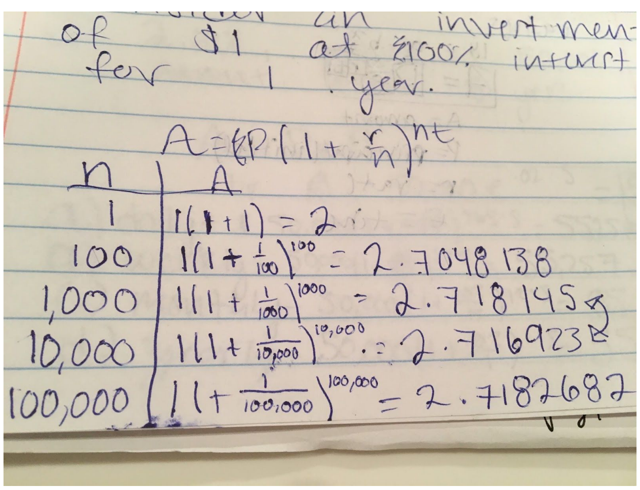
<tr><td>
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2. Compounding interest

Once I was able to differentiate simple interest and compounding interest it was easy to understand. Compounding interest is a value that is constantly given interest on top of the future values with interest, on the other hand, simple interest is in relation to a rate that is applied on the initial amount, or the principal amount. For example, simple interest may be a 4% rate on a $200 deposit, while compounding interest may be a weekly 3% rate on the amount an account after an initial value of $100.

Continuing compounding interest may also be yearly, monthly, weekly, or even daily. To model this situation, the equation $(1 + \frac{1}{n})^n$ is
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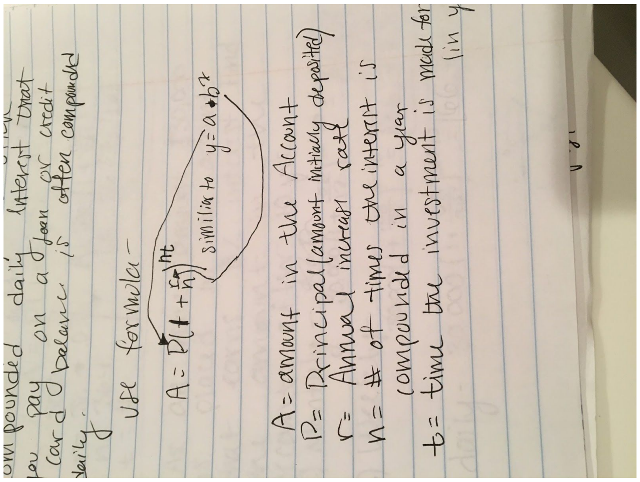
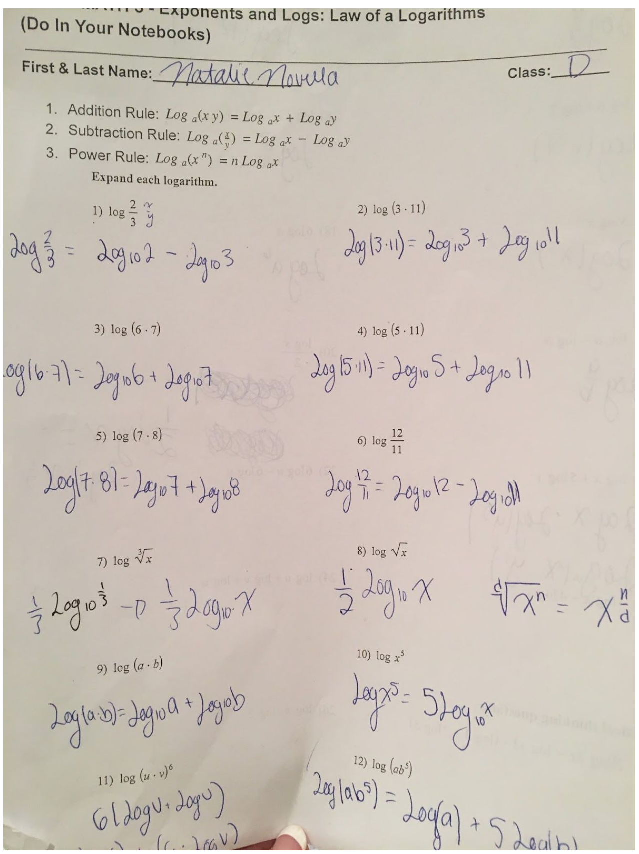
used. As seen on the left, n represents the amount of time the interest is compounding.



3. Solving for exponents in equations

Solving for exponents in equations took longer for me to grasp than the other concepts but once I grappled with it for while I understood and embraced it! This form of math is really useful to know, not only for later on in life but in the SATs. My success with this concept is evident by my work showcased on the left. When the bases of two exponents are not the same, you think of a least common multiple so that both sides look identical to one another. After applying the appropriate exponent to the value of either side and making both bases the same,you sort of disregard the bases and just solve for the exponents. This allows you to solve for x and apply the real exponent to the base.


Exponents and Logs: Law of a Logarithms

(Do In Your Notebooks)

First & Last Name: Natalie Novula Class: D

1. Addition Rule: $Log_a(xy) = Log_a x + Log_a y$
2. Subtraction Rule: $Log_a(\frac{x}{y}) = Log_a x - Log_a y$
3. Power Rule: $Log_a(x^n) = n\,Log_a x$

Expand each logarithm.

1) $\log \frac{2}{3}$
2) $\log (3 \cdot 11)$
3) $\log (6 \cdot 7)$
4) $\log (5 \cdot 11)$
5) $\log (7 \cdot 8)$
6) $\log \frac{12}{11}$
7) $\log \sqrt[3]{x}$
8) $\log \sqrt{x}$
9) $\log (a \cdot b)$
10) $\log x^5$
11) $\log (u \cdot v)^6$
12) $\log (ab^5)$

4. Logarithms

I'd run across logs during SATs and ACTs but never knew how to do them. That's why I was grateful when we first started learning about them, and everything came together nicely. It took me a while to translate the equation form over to log and memorize the equations.

The log properties are different yet similar in a variety of ways. As you cans see on the left, I caught on fairly quickly and utilized them well. For example, when the variables or values inside a logarithmic expression were being multiplied, I knew to use the addition rule in order to expand the problem.

Part 2: Exponents and Logs Unit Reflection (4 points)

I grappled with using logarithms efficiently and consistently. The concept and all the Log Properties were difficult for me to grasp at first and I pushed by using the HaMs and being confident, patient, and persistent. That being said, I feel pretty prepared for any run ins I might have with these concepts in the future, whether in the SAT, a quiz, or a real life situation, I now know how to solve problems using these concepts with ease and efficiency.

THE END