

## Assignment #1 – Exponential Potential

[30 marks]

### Assignment Objective

- Complete 4 or 6 “A” Questions [K/U, 8 marks]
- Complete 3 of 4 “B” Questions [ATIPS, 12 marks]
- Complete 1 of 2 “C” Questions [C, 5 marks]
- An additional 5 marks will be awarded based on how well your solutions are presented. [C, 5]

If you complete extra questions in “A” or “B”, you will be give the “best of” marks.  
Do not complete more than one “C” question. If you do, I will mark the first one in the assignment, and ignore the second.

### Part A: The Power is Yours! [K/U, 2 marks each]

1. Create a table of values and sketch the graph of \_\_\_\_\_.
2. A local forest is estimated to have a current population of \_\_\_\_\_ deer, and has been decreasing at a rate of \_\_\_\_\_ per year.
  - a. Create an equation that models the relationship between the population of deer and the time in years.
  - b. What will be the population of deer \_\_\_\_\_ years from now?
3. Simplify the following expression. Your final answer should contain positive exponents only.
  
  
  
  
  
  
  
  
  
  
4. Sketch the graph of  $y = \underline{\hspace{2cm}}$ . State any intercepts, asymptotes, and the domain and range.
5. Solve for  $x$ , using any method you choose: \_\_\_\_\_
6. Gabe has his headphones on, playing at a level of \_\_\_\_\_. Sounds that are "potentially fatal" have a level of 200dB. How many times more intense than Gabe's headphones is a "potentially fatal" sound?

Part B: log(cabin) [ATIPS, 4 marks each]

1. Taylor wants to buy a car that is currently worth \$\_\_\_\_\_ and is depreciating at a rate of \_\_\_\_\_% per year. She currently has \$\_\_\_\_\_ in an investment that earns \_\_\_\_\_% per year. Taylor plans to buy the car with her investment when it has grown to meet the car's value. How many years will Taylor wait to buy the car, and what will be the purchase price?
2. The half-life of Uranium-235 ( $^{235}\text{U}$ ) is about 700 million years. If there are 500,000 metric tonnes of  $^{235}\text{U}$  on earth today...
  - a. How long will it take to reach \_\_\_\_\_ metric tonnes remaining?
  - b. How much  $^{235}\text{U}$  was present when the Earth was formed?
3. Solve for x, algebraically:
  - a.
  - b.
4. The following chart shows the volume of ice in a Rocky Mountain Glacier for the past 5 years.
  - a. Estimate the annual rate of decrease in volume.
  - b. Create a model for the volume of ice over time.
  - c. In what year will the glacier be fully melted (less than  $1000\text{m}^3$ )?

Year	Volume ( $\text{m}^3$ )
2021	
2022	
2023	
2024	
2025	

Part C: Approach with... Confidence! [C, 5 marks]

1. We have looked at three methods for solving exponential equations – using a table, using a graph, or solving algebraically. Create some kind of presentable material that illustrates these three different methods. You can create anything you like – poster, powerpoint, comic strip – so long as it explains each process.
2. You many have noticed an [ $e^x$ ] and a [ln] button on your calculator. Do some research on e and ln and explain what they are and why they are important to exponential functions.