SECTION 9

MATH 123 Homework Section Exponential Growth

Section:_____ **Name:_____**

Show work in order to receive full credit.

1. Researchers find that there are 60 Raccoons on an island. When they return a year later, they find that there are 84. Assuming an exponential growth pattern, what is the annual population growth rate for the raccoons?

2. Your friend sends out a chain letter e-mail to 12 people by the next day 15 people have received the letter. Assuming an exponential growth pattern, what is the daily growth rate for the number chain letters received?

3. An arborist creates a table of different tree height patterns over a 4 year period. Which of the trees has an exponential growth pattern? Why?

Time	Yew	Willow	Mulberry
0	2	4	2
1	3.5	6	4
2	5	9	6
3	6.5	13.5	10

4. Consider the data in the table.

Time	Value	Absolute Change	Relative Change
0	13.60		
1	14.85		
2	16.10		
3	17.35		
4	18.60		
5	19.85		

   a. Complete the table by computing the absolute and relative change.

   b. Which model would better represent this data, linear or exponential? Write a meaningful sentence to explain your answer.

   c. Find the model for this data.

   d. What value does your model predict when time is 8?

5. Consider the data in the table.

Time	Value	Absolute Change	Relative Change
0	13.60		
1	17.00		
2	21.25		
3	26.56		
4	33.20		
5	41.50		

   a. Complete the table by computing the absolute and relative change.

   b. Which model would better represent this data, linear or exponential? Write a meaningful sentence to explain your answer.

   c. Find the model for this data.

   d. What value does your model predict when time is 8?

6. According to the 2010 United States Census, the population of Lafayette was 67,140, roughly a 19% increase from 56,397 in 2000.

   a. Construct an exponential model for Lafayette's population.

   b. Use your model to predict Lafayette's population in 2020.

7. **Frogs** – A species of frog's population grows 24% every year. Suppose 100 frogs are released into a pond.

   a. Construct an exponential model for this population.

   b. How many frogs will there be in 5 years?

   c. How many frogs will there be in 10 years?

   d. About when will there be 1000 frogs?

8. **Pandas** – There is a well-studied Panda population in Wuyipeng. In 1981 there were 25 Panda's and the researchers determined they had an annual population growth of 1.066. www.bearbiology.com

   a. Construct an exponential model for this population.

   b. Assuming no deaths, how many Panda's would the researchers expect by 2001?