Question 1 2 3 4 5

Description
Section 10.1 - Exponential Growth

Instructions
Please work all homework questions and clearly label / place your answers in the boxes (or parenthesis) provided. If you have questions, please feel free to email me at Joshua.Patterson@tamuc.edu

1. Question Details JModd7 10.1.012. [1666766]

This exercise deals with data from the U.S. Bureau of the Census on populations of metropolitan areas.† These data allow us to find how fast the population is growing and when it will reach certain levels. Such calculations are very important, because they indicate the future needs of the population for goods and services and how well the area can support the population.

The twelfth largest metropolitan area in the United States is the San Francisco/Oakland/Fremont metropolitan area. Its population in 2004 was 4,154 (in thousands); in 2007, it was 4,204.

(a) Develop the model that represents the population of the San Francisco/Oakland/Fremont metropolitan area. (Write your model in terms of t, where t is the number of years after 2004. Round the coefficient of t to seven decimal places.)

$p(t) =$

(b) Predict the population in 2016. (Round your answer up to the next whole number.)
[ ] thousands

(c) Predict the population in 2024. (Round your answer up to the next whole number.)
[ ] thousands

(d) Predict when the population will be double what it was in 2004. (Round your answer to one decimal place.)
[ ] years after 2004

2. Question Details JModd7 10.1.013.CMI. [1666755]

A biologist is conducting an experiment that involves a colony of fruit flies. (Biologists frequently study fruit flies because their short life span allows the experimenters to easily study several generations.) One day, there were 2,320 flies in the colony. Three days later, there were 5,480.

(a) Develop the mathematical model that represents the population p of flies. (Write your model in terms of t, where t is measured in days. Round the coefficient of t to seven decimal places.)

$p(t) =$

(b) Use the model to predict the population after one week. (Round your answer up to the next whole number.)
[ ] flies

(c) Use the model to predict when the population will be double its initial size. (Round your answer to one decimal place.)
[ ] days

3. Question Details JModd7 10.1.017. [1666828]

An October 2009 article in *The Industry Standard* states that "independent Twitter data shows exponential tweet growth." GigaTweet, an independent tweet-counting service, reports that the number of tweets was 5.0 billion in October 2009. In April 2009, the number of tweets was 1.6 billion.

(a) Develop the exponential growth model that fits with these data, where t is the number of months after April 2009 and p is the number of tweets in billions. (Round the coefficient of t to seven decimal places.)

$p(t) =$

(b) Use the model to predict when there will be 40.0 billion tweets. (Round your answer to the nearest whole number.)

[ ] months after April 2009

4. Question Details JModd7 10.1.018. [1672686]

According to a September 9, 2007, article in *ZDNet*, the number of Facebook users "is growing at 3 to 4 percent compounded weekly, with about 38 million members currently."

(a) Does this statement imply exponential growth?

- This implies exponential growth due to the phrase 'growing at 3 to 4 percent.'
- This does not imply exponential growth due to the phrase 'compounded weekly.'
- This does not imply exponential growth due to the fact that the actual percent is not given.
- This does not imply exponential growth due to the phrase 'growing at 3 to 4 percent.'
- This implies exponential growth due to the phrase 'compounded weekly.'

(b) Use these data (and a 3.5% weekly growth rate) to develop the exponential growth model for the number of users, where t is the number of weeks after September 9, 2007, and p is the number of Facebook members in millions. (Round the coefficient of t to seven decimal places.)

$p(t) =$

(c) Use the model to predict the number of Facebook users in the first week of January 2011. (Assume the total number of weeks is 173. Round your answer to the nearest whole number.)

[ ] million

(d) The article goes on to say that "In three years, we could have everybody on the planet, but that's not going to happen." Discuss why it's not going to happen and what this means about using an exponential model to make predictions.

5. Question Details JModd7 10.1.019. [1672703]

The number of cell phone subscribers has been growing exponentially for some time. According to *Information Please Almanac*, there were 109,478 thousand cellular phone subscriptions in the United States in 2000. In 2002, there were 140,766.

(a) Develop the exponential model that represents the nations cellular phone subscriptions. (Write your model in

terms of t, where t is the number of years after 2000. Let p represent the number of cell phone subscriptions in thousands. Round the coefficient of t to seven decimal places.)

$p(t) =$

(b) Use the model to predict the number of subscriptions in 2004. (The actual number in 2004 was 182,140 thousand. Round your answer to the nearest whole number.)

[ ] thousand

(c) Use the model to predict the number of subscriptions in 2006. (The actual number in 2006 was 233,000 thousand. Round your answer to the nearest whole number.)

[ ] thousand

Assignment Details