Precalculus Worksheet #2 Chapter 4 page 1 _____

Solve each of the following problems. Show all of your work neatly organized. (Round off to 3 significant digits, where appropriate.)

1. A certain city had a population of 100,000 in 1980 and 135,000 in 1990.
a. Express the population as a function of time using the model $P = Ce^{kt}$. Assume t = 0 corresponds to the year 1980.

_____

b. Use your model to estimate the cities population in the year 2000.

2. A certain radioactive substance, having a current mass of 25.7 grams, has a half-life of 2500 years.
a. Express the quantity of the substance as a function of time using the model $Q = Me^{kt}$.

_____

b. Use your model to approximate the mass remaining in 6500 years.

Precalculus Worksheet #2 Chapter 4 page 2

Solve each of the following problems. Show all of your work neatly organized. (Round off to 3 significant digits, where appropriate.)

3. A computer that costs $1800 new has a depreciated value of $900 after 5 years.
a. Express the depreciated value of the computer as a function of time using the model $V = Ce^{kt}$.

_____

b. Use your model to approximate the depreciated value of the computer after 7 years.

4. A particular strain of bacteria grows in a culture from a population of 300 bacteria to 500 bacteria in 8 hours.
a. Express the number of bacteria present in the culture as a function of time using the model $N = Ce^{kt}$.

b. Use your model to estimate the number of bacteria present after 15 hours.