Pre-Calc (Exponential Growth and Decay)   Name_____

YOU MUST SHOW ALL YOUR WORK TO RECIEVE CREDIT!

Classwork 3.1 & 3.5

For questions 1 - 4, use the compound interest formulas $A = P\left(1 + \dfrac{r}{n}\right)^{nt}$ and $A = Pe^{rt}$ to solve.

1) Find the accumulated value of an investment of $1000 at 10% compounded quarterly for 2   1) _____
   years.

2) Find the accumulated value of an investment of $1000 at 7% compounded continuously   2) _____
   for 6 years.

3) Find the accumulated value of an investment of $6500 at 6.5% compounded monthly for   3) _____
   12 years.

4) Suppose that you have $8000 to invest. Which investment yields the greater return over 9   4) _____
   years: 7.5% compounded continuously or 7.6% compounded semiannually?

Solve.

5) The value of a particular investment follows a pattern of exponential growth. In the year 2000, you invested money in a money market account. The value of your investment t years after 2000 is given by the exponential growth model $A = 3100e^{0.046t}$. When will the account be worth $3902?

6) The population of a particular country was 22 million in 1984; in 1995, it was 28 million. The exponential growth function $A = 22e^{kt}$ describes the population of this country t years after 1984. Use the fact that 10 years after 1984 the population increased by 9 million to find k to three decimal places.

7) An endangered species of fish has a population that is decreasing exponentially $(A = A_0e^{kt})$. The population 5 years ago was 1700. Today, only 1100 of the fish are alive. Once the population drops below 100, the situation will be irreversible. When will this happen, according to the model? (Round to the nearest whole year.)

8) The function $A = A_0e^{-0.00866x}$ models the amount in pounds of a particular radioactive material stored in a concrete vault, where x is the number of years since the material was put into the vault. If 900 pounds of the material are placed in the vault, how much time will need to pass for only 567 pounds to remain?