1. (2 pts) How many years does it take an investment of $1,000 to triple if it is invested at 5.1% compounded monthly? (Give answer to two decimal places.)

2. (2 pts) How long will it take for $1000 to grow to $5000 at an interest rate of 9.2% if interest is compounded continuously? (Give answer to two decimal places.)
3. (2 pts) Following the birth of his niece, a rich uncle wants to guarantee that his niece has $500,000 in an account paying 7.5%, compounded quarterly, on her 21st birthday. How much will he need to deposit into the account? (Give answer to two decimal places.)

4. A bacteria culture doubles in size every 4 hours.

   (a) (1 pt) Find the growth constant $k$. (Give answer to four decimal places.)

   (b) (1 pt) How many hours will it take the sample to triple in size? (Give final answer to two decimal places.)
5. A researcher places 5000 bacteria in a petri dish. After 10 hours, the researcher notes that there are 8000 bacteria present.

(a) (1 pt) Assuming the population grows exponential, find the growth constant $k$. (Give answer to four decimal places.)

(b) (1 pt) How many bacteria are present after 16 hours? (Give answer to the nearest whole number.)

(c) (1 pt) How long does it take for the bacteria population to double? (Give answer to two decimal places.)
6. The half-life of a certain radioactive isotope is 15 days. Assume that 12 grams of the isotope are present.

(a) (1 pt) Find the decay constant $k$. (Give answer to four decimal places.)

(b) (1 pt) How much of the isotope will be left after 9 days? (Give answer to two decimal places.)

(c) (1 pt) How long will it take for the initial sample of this isotope to be reduced to 4.5 grams? (Given answer to two decimal places.)

(d) (1 pt) How long will it take for 80% of the initial amount to decay? (Give answer to two decimal places.)