Mixed Word Problems

1. You put $5000 in the bank in a savings account that makes 2% annual interest. After how many years will there be $8000 in the account if the account is compounded monthly?

2. You put $5000 in a savings account that makes 2% interest compounded continuously.
   a. How much money do you have after 8 years?
   b. How many years does it take until the account has $10,000 in it?

3. The number of bacteria present at any time \( t \) can be represented using the exponential growth model, \( f(t) = Ce^{kt} \) where \( t \) is time in hours. If there are 100 bacteria present at the beginning, and 300 present 5 hours later, estimate the time required for the bacteria to grow to a population of 500.

4. If you borrow $5000 for 5 years at 9% annual interest, how much INTEREST will you pay on the loan if interest is compounded quarterly?

5. Bob invests $200 into an account that is compounded continuously at an interest rate of 3%. How much money will he have after 2 years?
6. Use the exponential model, \( f(t) = Ce^{kt} \) to find the time it takes $20,000 to double in value if it is invested at 6 1/2 % interest compounded continuously.

7. Each day, 15% of the chlorine in a swimming pool evaporates. After how many days will 60% of the chlorine have evaporated? (Careful of the %)

8. You are collecting cats. You collect them exponentially at an annual growth rate of 124%. If you started with only 2 cats, how many cats do you have after 10 years?

9. Radium is stored in a container. The amount \( R \) (in grams) of radium present after \( t \) years can be modeled by \( R = Pe^{-0.00013t} \). What is the initial amount of radium if after 1057 years there are only 3 grams left?

10. The half-life of Raptonium is 4 hours. How much of a 24 gram sample will remain after 6 hours

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11. e^{2x} - 3e^x + 2 = 0 \\
12. \left( \frac{1}{3} \right)^{x-1} = 9^{2x-4}
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Finish using Ch. 4 Review in Textbook Pg. 291 (1-4, 6-34) SKIP 21-23  Pg. 295 (27)