Exponential Growth/Decay Mixed Word Problems

1. How long does it take for an investment to double in value if it is invested at 8% per annum compounded monthly? Compounded continuously?

2. **If Akul has $100 to invest at 8% per annum compounded monthly, how long will it be before he has $150? If he kept it in an account that compounds continuously for the same amount of time, how much MORE would he make?**

3. How many years will it take for an initial investment of $10,000 to grow to $25,000? Assume a rate of interest of 6% compounded continuously

4. Rupurt will be buying a new car for $15000 in three years. How much money should he ask his parents for now so that, if he invests it at 5% compounded continuously, he will have enough to buy a new car?

5. A business purchased for $650000 in 1994 is sold in 1997 for $850000. What is the annual rate of return for this investment?

6. Tanya has just inherited a diamond ring appraised at $5000. If diamonds have appreciated in value at an annual rate of 8%, what was the value of the ring 10 years ago when the ring was purchased?

7. The population of a colony of mosquitoes obeys the law of continuous growth. If there are 1000 mosquitoes initially, and there are 1800 after one day, what is the growth rate?   What is the size of the colony after 3 days? How long is it till there are 10000 mosquitoes?

8. The population of a southern city has continuous growth. If the population doubled in size over a 2 year period and the current population is 10000, what will be the population in 10 years?

9. The half-life of Radium is 1690 years. If ten grams are present now, how much will be present in 50 years? Find r first!!

10. A piece of charcoal is found to contain 30% of the carbon-14 it originally had. When did the tree from which the charcoal came die? Use 5600 years as the half-life of carbon-14.

11. After the release of radioactive material into the atmosphere in Ukraine in 1986, the hay in Austria was contaminated by iodine-131 (half life 8 years). If it is okay to feed the hay to cows when 10% of the iodine-131 remains, how long do the farmers need to wait to use this hay?

Key to Exponential Mixed Application sheet (HM3)

1. 8.693 yrs; 8.664 yrs
2. 5.085yrs; $0.20
3. 15.27yrs
4. $12910.62
5. 9.3%
6. $2315.97
7. 5832 mosquitoes; 3.9 days
8. 320000 people
9. 9.797 g
10. 9727 yrs ago
11. 26.58 yrs