

Application of first order DE

Question:

1. In a piece of burned wood, it was found that 85.5% of carbon has decayed. What is the approximate age of the wood? Assume that the half life of carbon is 5600 years.
2. The population of a city increases at a rate proportional to the the present number. It has an initial population of 50000 that increases by 15% in 10 years. What will be the population in 30 years?
3. The population of a certain community is known to increases at a rate proportional to the number of people present at any time. If the population has doubled in 5 years, how many years will it take triple? To quadruple?
4. It is found that after 15 years 0.043% of plutonium disintegrates. Find its half life, if the rate of disintegration is proportional to the amount remaining.
5. A fossilized bone is found to contain 1/1000 of the original amount of carbon. Determine the age of fossil. Assume that the half life of carbon is 5600 years.
6. The population of a country increases at the rate proportional to the number of inhabitants. If the population doubles in 30 years. In how many years will it triple?