

1. A population of bacterial in a culture is increasing exponentially. The original culture of 25,000 bacteria contains 40,000 bacteria after 10 hours.
 - (a) When will there be 60,000 bacteria in the culture?
 - (b) What is the doubling time for the culture?
2. Suppose the amount of a particular radioactive specimen present decreases exponentially. If 5000 grams decreases to 4000 grams in 5 days, find the half-life of the specimen.
3. Suppose the amount of a radioactive isotope decays exponentially with a half-life of 20 days. If 50 mg of the isotope remains after 10 days,
 - (a) how much of the isotope was initially present?
 - (b) how much will remain after 30 days?
 - (c) when will 90% of the initial amount have disintegrated?
4. Ten grams of a radioactive substance decays exponentially so that eight grams remain after five years.
 - (a) Find the function describing the amount of the substance present at time t .
 - (b) How much remains after ten years?
 - (c) Determine the half-life of the substance.
5. Suppose that five grams of a radioactive substance decreases exponentially to four grams in thirty seconds.
 - (a) What is the half-life?
 - (b) When will one-fifth of the initial amount remain?
6. A bacteria culture grows exponentially from 10,000 bacteria to 25,000 bacteria in nine hours.
 - (a) Find the function describing the growth of the bacteria population.
 - (b) When does the population double?
 - (c) When does the population triple?