

$$y = y_0 e^{kt}$$

1. The population of India is increasing at 1.2 % per year. If the current (year 2016) population is 1.3 billion, what will the population be in 2050?
2. Suppose the a county's population rose from 35,400 in 1970 to 61,000 in 2010. What has its annual population growth been?
3. Potassium 42 has a decay rate of 5.5% per hour. In how many hours will the original quantity be halved? HINT: Write the decay rate as a decimal first; it will be negative.
4. Carbon 14 has a half life of 5700 years. In how many years will a wooden desk made of fresh lumber have 75% of its original carbon 14 remaining? HINT: Find the decay constant from the half-life first: $k = \frac{\ln .5}{\text{halflife}}$. This decay constant will be negative.
5. In how many years will an investment of \$1200 at 3.1% APR compounded continuously grow to \$5000?
6. A radioactive isotope decays from 2.1 grams to 1.7 grams in 2 years. What is this elements annual decay rate?