

1. I inject a 100mg aspirin at noon. Aspirin in the body, at this dosage, has a half life of 3 hours. How much aspirin is in my body at:
 - a) 6pm
 - b) 3pm
 - c) 1pm
 - d) 4:45pm

2. You start with a 100g lump of a radioactive isotope. A year later the lump has a mass of 97.7g. What is the half life of the isotope?

3. At time $t = 0$ minutes, a colony of E. coli has 10000 cells. The population is growing exponentially, and after 60 minutes it has 90000 members. Find a function of the form

$$p(t) = C 10^{at}$$

that describes the population size.

4. The function $f(x) = 2^{-3x}$ can be written in the form $f(x) = 10^{-ax}$ for a certain constant a . Determine the value of a .

5. Use the change of base formula to rewrite $\log_{10}(7)$ in terms of the natural logarithm, \ln .

6. Solve the following equation for x :

$$\ln(x) + \ln(x - 1) = 2.$$

7. Find the inverse function of $f(x) = 1 + \sqrt{2 - 3x}$. Remember:

- a) Write $y = f(x)$.
- b) Solve for x .
- c) The resulting expression in terms of y is $f^{-1}(y)$.