Quiz 6

MATH 1A Fall 2015

22 October 2015

Exercise 6.1. The isotope Carbon-15 is radioactive with a half-life of about 2 seconds. We'll measure radioactivity in terms of decays per second, i.e. the number of atoms per second lost to radioactive decay.

Suppose we are given (say at $t = 0$) a sample of Carbon-15 with 10^{23} atoms, and assume that our sample decays exponentially.

1. How many decays per second will we measure at $t = 0$?
2. Suppose in this scenario that 10^{10} decays per second is the maximum safe level of radiation. At what time will our sample become safe to handle?
3. At that time, how much Carbon-15 is left?
4. How long will it take for our sample to disappear completely? (I.e. how long until there is less than 1 atom left?)