Chapter 1:

1.1 Radioactive decay:

- the average lifetime for ^{235}U is approx 1x10⁹ years.

$\frac{dN_u}{dt} = -\frac{N_u}{\tau}$ $\quad N_u = N_u(0)e^{-t/\tau}$ $\quad N_u$ = number of nuclei.

1.2 Numerical approach:

- obtain N_u as a function of t.

$N_u(\Delta t) = N_u(0) + \frac{dN_u}{dt}\Delta t + \frac{1}{2}\frac{d^2N_u}{dt^2}(\Delta t)^2 + \ldots \approx N_u(0) + \frac{dN_u}{dt}\Delta t$

the 2nd order and higher terms are left out, Approximating Δt to be small. this causes error but the error is so small in this case. In some cases, the error will be greater and more matter.

1.3 Pseudo code: - Declare necessary variables and arrays
- initialize variables
- Do actual Calculation - Store results.

1.4: - always have an idea of how the output should look.
- ran program to limits to check that it gives the correct answer.
- Check that the program gives the same answer for different "step sizes".
- plot exact solution line, because your line should be somewhere along that line.

1.6 Program Structure - use subroutines (functions) to organize major tasks.
- use descriptive names.
- Comment statements to explain program.
- make code clear, even though code can be made short, do it the long and clear way to make the code more understandable.
- label graph axes and label (units).