1. Project 2

For drugs that are fat-soluble, a three-compartment model is sometimes used.

Set up a discrete three-compartment model with the following assumptions:

- The first compartment represents the digestive tract. As soon as the medication is ingested, assume the quantity in this compartment instantly reaches the quantity ingested.
- The second compartment represents the bloodstream. Once in the bloodstream, the medication can be absorbed by fatty tissue, or metabolized.
- The third compartment represents the fatty tissue. Once absorbed from the bloodstream, the substance can break down or be re-absorbed into the bloodstream.

Assume the following values:

- Once in the digestive tract, 13% of the substance is absorbed into the bloodstream every 15 minutes.
- Once in the bloodstream, 4% is absorbed into fatty tissue each hour, while 11% is metabolized.
- Once in the fatty tissue, 2% is broken down every hour, while 1% is reabsorbed into the bloodstream.

Use a spreadsheet to model the amount of the drug in each compartment over time if a dose of 400mg is given at time zero.

Suppose instead that the same amount of drug is given intravenously. Modify your solution do compute the amount in each compartment for this situation.