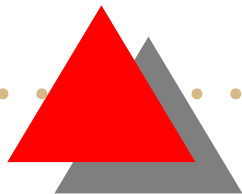




*Math 2E03- Introduction to
Modelling*

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Problem 11

Two large tanks, each holding $100L$ of liquid, are interconnected by pipes, with the liquid flowing from tank A into tank B at a rate $3L/min$ and from B into A at a rate of $1L/min$. The liquid inside each tank is kept well stirred. A brine solution with a concentration of $2kg/L$ of salt flows into tank A at a rate of $6L/min$. The solution flows out of the system from tank A at $4L/min$ and from tank B at $2L/min$. If, initially, tank A contains pure water and tank B contains $200kg$ of salt, set up the initial value problem for this model.



Problem 12

A rock contains two radioactive isotopes, RA_1 and RA_2 , that belongs to the same radioactive series; that is, RA_1 decays into RA_2 , which then decays into stable atoms. Assume that the rate at which RA_1 decays into RA_2 is $50e^{-10t} \text{ kg/sec}$. Given information $k = 2/\text{sec}$ is the decay constant and $y(0) = 40 \text{ kg}$, find the mass $y(t)$ of RA_2 .