Math 2E03- Introduction to Modelling
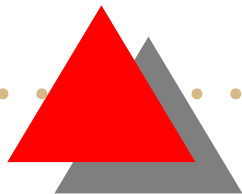
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Problem 8

Carbon dating is often used to determine the age of a fossil. For example, a humanoid skull was found in a cave in South Africa along with the remains of campfire. It is determined that only 2% of the original amount of carbon-14 remains in the burnt wood of the campfire. Estimate the age of skull if the half life of carbon-14 is about 5600 years.

Problem 9

A white wine at room temperature $70^o F$ is chilled in ice $(32^0 F)$. If it takes 15 min for the wine to chill to $60^o F$, how long will it take for the wine to reach $56^o F$.

Problem 10

Two large tanks, each holding 24 liters of a brine solution, are interconnected by pipes. Fresh water flows into tank A at a rate of $6L/min$, and fluid is drained out of tank B at the same rate: also $8L/min$ of fluid are pumped from tank A to tank B, and $2L/min$ from tank B to tank A. The liquids inside each tank are kept weel stirred, so that each mixture is homogenous. If initially, the brine solution in tank A contains $x_0 kg$ of salt and that in tank B initially contains $y_0 kg$ of salt, determine the mass of salt in each tank.