1. Consider a tank which has 400 gallons of a salt-water mixture. Initially, the tank has 15 lbs of salt in it. Water flows into the tank at a rate of 30 gallons per minute, and there is 1/2 lb of salt per gallon. There is a mixing device in the tank which keeps the salt evenly distributed throughout the salt-water mixture. The salt-water mixture flows out of the tank at a rate of 30 gallons per minute. Find the concentration (lbs per gallon) of salt in the tank in the long run.

2. Consider a tank which has 400 gallons of pure water, and has a capacity of 700 gallons. Salt water begins to flow into the tank at a rate of 5 gallons per minute and there are 10 grams of salt per gallon. There is a mixing device in the tank which keeps the salt evenly distributed throughout the tank. The mixture in the tank flows out at a rate of 3 gallons per minute. How much salt will be in the tank the instant it begins to overflow?