

Suggested problems 8

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1. A tank is initially filled with 600 liters of a solution containing 100 grams of sugar. Solution containing a concentration of 2 g/liter sugar enters the tank at the rate 4 liters/minute and the well-stirred mixture leaves the tank at the same rate. Find the amount of sugar in the tank at time t , and find the limiting amount of sugar in the tank as $r \rightarrow +\infty$.
2. A swimming pool holds $100m^3$ of pure water. Solution containing $2kg/m^3$ of chlorine enters the pool at a rate of $3m^3/min$. A drain is opened at the bottom of the pool so that the volume of solution in the pool remains constant. Find : (i) the amount of chlorine in the pool at time t , (ii) the amount of chlorine in the pool after one hour, and (iii) find the maximum amount of chlorine in the pool if the process is to continue indefinitely.