

CSM MACS 315F Homework and Quizzes, Spring 2002

Homework

HW2. (1/21/2)

1. 2.3.5
2. 2.3.14
3. 2.3.18
4. (cf. 1.2.13) A 200-volt electromotive force is applied to an RC series circuit in which the resistance is 1000 ohms and the capacitance is 5×10^{-4} farad. (a) Find the charge $q(t)$ on the capacitor if $i(0) = 0.4$. (Note $i(t) = dq/dt$.) (b) Determine the charge and current at $t = 0.005$ s. (c) Determine the charge as $t \rightarrow \infty$.
5. A large tank is partially filled with 100 gallons of fluid in which 10 pounds of salt is dissolved. Brine containing $1/2$ pound of salt per gallon is pumped into the tank at a rate of 6 gal/min. The well-mixed solution is then pumped out at a slower rate of 4 gal/min. Find the number of pounds of salt in the tank after 30 minutes.
6. 3.1.20