Math 254 Spring 2011 HW #3 Due Wednesday, February 2nd

NAME _____ SECTION # [ ] (10)

(Show work on back)

At time zero, a 200 gallon tank initially containing 50 gallons of pure water is filled with a brine solution containing $\frac{1}{2}$ lb./gal at a rate of 4 gal/min. It is drained at the rate of 3 gals/min. Find $x(t)$, the # lbs. salt after t minutes, and $C(t) = \frac{x(t)}{V(t)}$, the concentration in lbs./gal where $V(t)$ is the volume of the mixture after t minutes.

(3) $x(t) =$

(1) $C(t) =$

(1) $V(t) =$

What are ($\frac{1}{2}$) $x(0) =$, ($\frac{1}{2}$) $C(0) =$, ($\frac{1}{2}$) $C(50) =$,

($\frac{1}{2}$) $C(100) =$, ($\frac{1}{2}$) $C(150) =$.

At what time $t = t_1$ does the tank overflow? $t_1 =$.

($1\frac{1}{2}$) Draw $C(t)$ as a solid line for $0 < t < t_1$ and as a dotted line for $t > t_1$.