Do *one* of the following.

1. An RC circuit conatins a 1000 ohm resistor and a 10^{-5} farad capacitor. The capacitor is initially uncharged. A voltage source of 5 volts is applied starting at time 0. How long does it take before the voltage on the capacitor reaches 3 volts?

   Recall that $E_C(t) = \frac{1}{C}q(t)$ and that

   $$q' + \frac{1}{RC}q = \frac{E}{R}$$

2. A tank contains 200 gal of a 2 % solution of HCl. A 5 % solution of HCl is added at 5 gal/min. The well mixed solution is being drained at 5 gal/min. When does the concentration of HCl in the solution reach 4 %?