PHYS 2022 - Homework 12
Due Wednesday, April 28, 2010.

Reading: French pp. 102-105;
Halliday: electricity, AC circuits, electrical resonance, impedance.

Problems:

1. An oscillating circuit consisting of a capacitor with capacitance C and a coil of inductance L maintains free undamped oscillations with voltage amplitude across the capacitor V_m. Find the relation between the current $I(t)$ in the circuit and the voltage $V(t)$ across the capacitor. Solve this problem using Ohm's law and then the energy conservation law.

2. French 4-16

3. French 8-3

4. French 8-4

5. In an oscillating circuit with quality Q=5000 and oscillation frequency 2.2 MHz, how long does it take for the current amplitude to decrease by a factor of 2?