Assignment 7; Phys 191 Name _____

1. (60 points) You have a single-loop circuit with an AC voltage source $V_s = V_0\, e^{i\omega t}$ together with a capacitor C, a resistor R, and an inductor L. The voltage across an inductor is $V_L = L\, dI/dt$. Set up the differential equation for Q, the charge on the capacitor. Solve for Q_p, the non-transient behavior, and also find I_p, the corresponding current.

2. (40 points) What is the resonance frequency for this circuit, where I_p is a maximum?