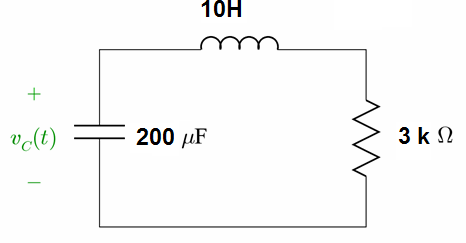
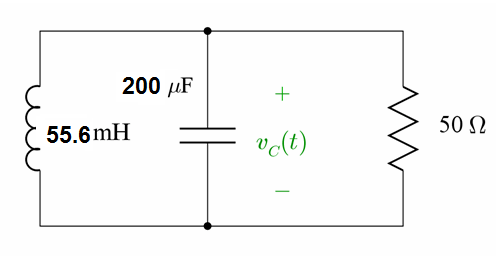
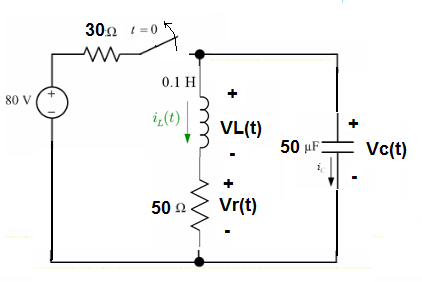
ENGR 12 Assignment 9 Due: next wed

**Part I. Drills -- 1 point each** Determine the type of response (under, critical, over-damped) for these 2nd order circuits:

1. 2)

3) For the following circuit, the switch is initially closed and has been for a long time.   
 Find the initial values of Vc(t), iL(t), VL(t) and Vr(t) at t=0-, and diL(t)/dt at t=0+.



4) Derive the formula for the inductor current iL(t) in problem 3 for t>0.

5) [Skip this!] Derive the formula for the capacitor voltage Vc(t) in problem 3 for t>0.

6) What value of the inductor in problem 3 would make the circuit critically damped?

**Part II. Assisted Problem Solving – 2 pts**

|  |  |
| --- | --- |
| 7) The natural voltage response of a parallel RLC circuit is v(t) = 75e-8000t(cos 6000t – 4sin 6000t) Volts, for t>0  If the inductor is 400 mH, find the values of C, R, Vo | PLAN   1. note that this is underdamped 2. compare the equation to the formula for underdamped and notice where different parameters appear and match them up using algebra where needed. |

**Part III. Unassisted Problem Solving – 3 points**

8)