Chapter 8 Homework:

1. For the circuit below,
2. Determine the second order differential equation governing *v(t)*.
3. Find R so that the circuit is critically damped.



1. For the circuit below,
2. Determine the differential equation that governs *vC(t), t>0*.
3. Is the system under, over, or critically damped?



1. For the circuit below,
2. Determine the differential equation for *iL(t), t>0.*
3. Determine the initial (t=0+) and final (t→∞) conditions on *vC(t)* and *iL(t).*



1. The switch moves from position A to position B at t=0 seconds.
2. Determine the differential equation that governs *iL(t), t>0*.
3. Determine initial (t=0+) and final (t→∞) conditions on *vC(t)* and *iL(t).*



1. For the circuit below,
2. Determine the differential equation governing *i(t)*.
3. Determine ζ and ωn
4. Find the maximum value of current through the resistor in response to a step input   
   *u(t) =* *3u0(t)* A.



1. A current in a second order circuit is described by the differential equation
2. Determine the damping ratio, undamped natural frequency, and damped natural frequency for the circuit.
3. Sketch the response of the circuit to a unit step input. Include numerical values for *tr*, the maximum value of *i(t)*, and the steady-state value of *i(t).*
4. For the circuit below, determine
5. The differential equation for *iL(t), t>0.*
6. The initial (t=0+) and final (t→∞) conditions on *vC(t)* and *iL(t).*



1. The switch moves from position A to position B at t=0 seconds.
2. Determine the differential equation that governs *vC(t), t>0*.
3. Determine initial (t=0+) and final (t→∞) conditions on *vC(t)* and *iL(t).*



1. The switch moves from position A to position B at t=0 seconds.
2. Determine the differential equation that governs *vC(t), t>0*.
3. Determine initial (t=0+) and final (t→∞) conditions on *vC(t)* and *iL(t).*



1. The differential equation governing a voltage *vout(t)* in a circuit is:



Determine the maximum value of *vout(t)* resulting from a step voltage input  
 .

1. For the circuit below, determine
2. The differential equation for *iL(t), t>0*
3. The initial (t=0+) and final (t→∞) conditions on *vC(t)* and *iL(t).*

