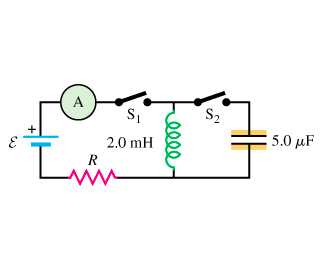
PY212

**Discussion Worksheet 9**

Please work with your partners on the following exercises.

1. In the circuit shown, switch  has been closed for a long enough time that the current reads a steady 3.00 A. Suddenly, switch is closed and  is opened at the same instant.



1. What is the energy stored in the inductor?
2. What is the maximum charge that the capacitor will receive after switch is closed and  is opened? [Hint: What is conserved in this problem?]
3. After switch is closed and  is opened, how long does it take the capacitor to reach the maximum charge found in part b? [Hints: What type of circuit is it now (be careful)? What do you know about this type of circuit?]
4. What is the current in the inductor at this time?
5. Supposed we doubled the inductance, how would the time to reach maximum charge (found above in part c) change?

2) A capacitor with capacitance 6.00 x 10-5 F is charged by connecting it to a 12.0 V battery. The capacitor is disconnected from the battery and connected across an inductor with L = 1.50 H.

a) What are the angular frequency of the electrical oscillations and the period of these oscillations (the time for one oscillation) ?

b) What is the initial charge on the capacitor ?

c) How much energy is initially stored in the capacitor ?

d) What is the charge on the capacitor 0.0230 s after the connection to the inductor is made ? Interpret the sign of your answer.

e) At the time given in part d), what is the current in the inductor ?

f) At the time given in part d), how much electrical energy is stored in the capacitor and how much energy is stored in the inductor ?