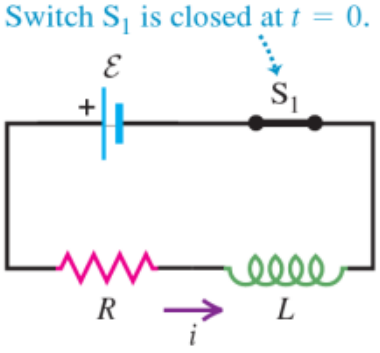
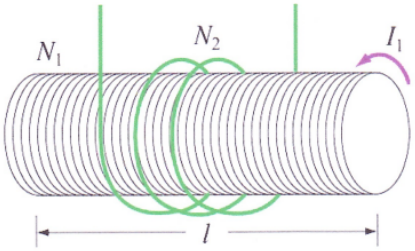
Name: 1C Midterm Review - Week 4

1. **LR Circuit** *(YF 12th ed. Fig. 30.12)*. Calculate the current in the circuit as a function of time, $I(t)$. [Hint: Apply Kirchoff's rule to find the circuit equation; determine initial and final currents; integrate with respect to time.]



2. **Previous Midterm** *(by Prof. Simon).* The figure below shows two coils. Coil 1 is a long straight solenoid with N_1 windings and cross sectional area A. Coil 2 has N_2 windings wrapped along a short length of the solenoid. What is the mutual inductance M due to the current I_1 in the solenoid?



3. **Biot-Savart** *(YF 13th ed. 28.74).* The figure below shows two semicircles with radii a and b. Calculate the net magnetic field (magnitude and direction) that the current in the wire produces at P.