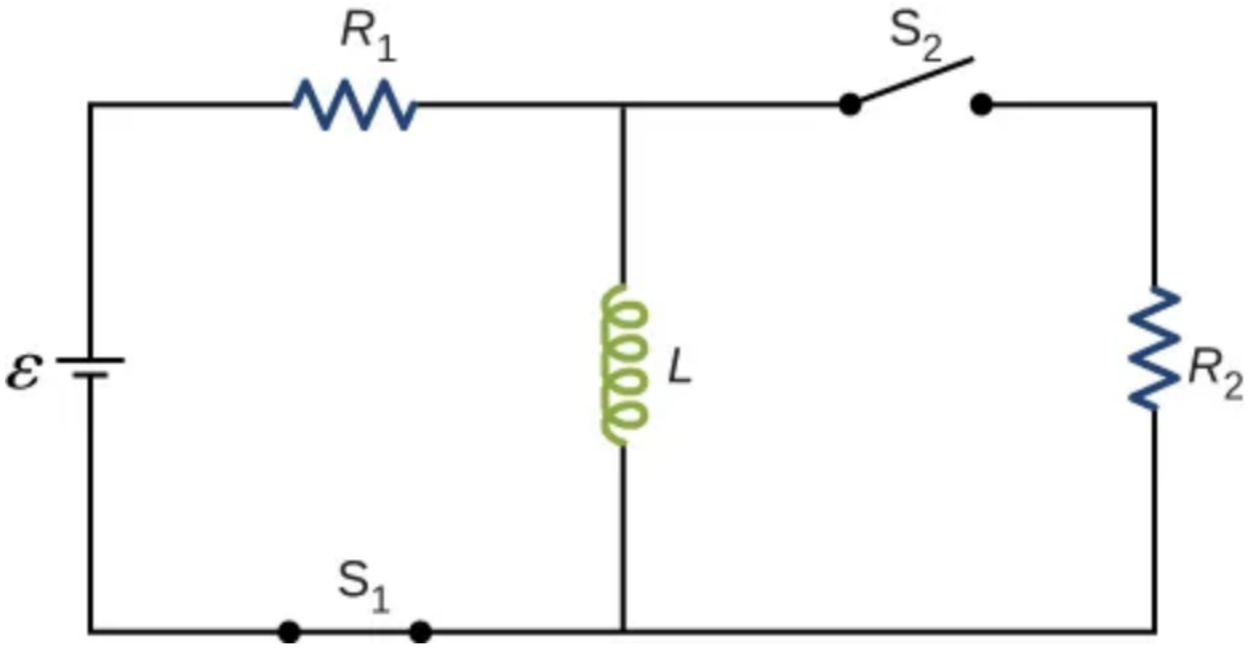
29. An emf of 9.7×10^{-3} V is induced in a coil while the current in a nearby coil is decreasing at a rate of 2.7 A/s. What is the mutual inductance of the two coils?

35. An emf of 0.40 V is induced across a coil when the current through it changes uniformly from 0.10 to 0.60 A in 0.30 s. What is the self-inductance of the coil?

47. Suppose that a rectangular toroid has 2000 windings and a self-inductance of 0.040 H. If $h = 0.10\,\text{m}$, what is the current flowing through a rectangular toroid when the energy in its magnetic field is $2.0 \times 10^{-6}\,\text{J}$?

53. For the circuit shown below, $\varepsilon = 20\ \text{V}$, $L = 4.0\ \text{mH}$, and $R = 5.0\ \Omega$. After steady state is reached with S_1 closed and S_2 open, S_2 is closed and immediately thereafter (at $t = 0$) S_1 is opened. Determine (a) the current through L at $t = 0$, (b) the current through L at $t = 4.0 \times 10^{-4}\ \text{s}$, and (c) the voltages across L and R_1 at $t = 4.0 \times 10^{-4}\ \text{s}$. $R_1 = R_2 = R$.



63. The self-inductance and capacitance of an *LC* circuit are 0.20 mH and 5.0 pF. What is the angular frequency at which the circuit oscillates?

71. In an oscillating *RLC* circuit with $L = 10\ \text{mH}$, $C = 1.5\ \mu\text{F}$, and $R = 2.0\ \Omega$, how much time elapses before the amplitude of the oscillations drops to half its initial value?