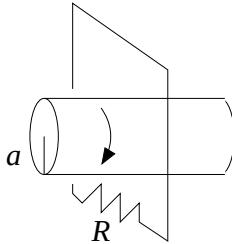
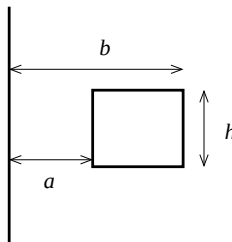


Review Questions for Chapter 7

1. A wire loop encloses a solenoid, as shown. The solenoid carries a varying current $I(t) = I_0 \cos(\omega t)$. Determine the current in the outer loop.



2. Consider two “loops”: one is a straight line wire (that loops back around to itself somewhere infinitely far away) and the other is a rectangular loop. The loops lie in the same plane. Determine the mutual inductance M .



3. Show that Ampere’s Law is inconsistent with charge conservation.
4. A magnetic rail gun is a U-shaped loop of wire, with a sliding bar across it that completes a circuit. The goal is to get the bar accelerating to the right. Find two different ways to make this happen (using $\mathbf{B}$ fields and currents).

