- 1. I demonstrated in the lecture a short cylindrical bar magnet being dropped through a vertical aluminum pipe and through a PVC pipe. When dropped through a PVC pipe, the total time it takes for the bar magnet to fall through 6 feet is a little bit over 0.5 second. When dropped through a copper pipe the total fall time is 10 seconds. Explain what is happening. What has this to do with the damped eddy current pendulum of figure 7.16?
- 2. Estimate the induction current in the copper tube assuming the magnetic field of the permanent magnet to be 1.2 tesla, the weight of the permanent magnet to be 20 grams, the diameter of the copper tube to be 0.5 inch and the height of the magnet to be 1 cm, the currents to be located 0.5 inch below the falling magnet and 0.5 inch above the falling magnet.
- A long solenoid with radius b and n turns per unit length carries a time-dependent current I(t) in the φ_head direction. Find the magnitude and direction of the electric field at a distance s from the axis of the solenoid.
- 4. Work problems 7.12, 7. 16, 7.18 and 7.22.