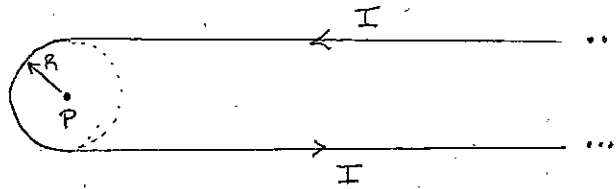


PHY 4B03 – Problem Set #3

Due: November 9, 2012 (in class)

1. Griffiths, 4.16.
2. Griffiths, 4.40.
3. Griffiths, 5.39.
4. Griffiths, 5.43.
5. A capacitor comprises a conducting sphere of radius a and a concentric hollow conducting sphere of radius b surrounding the first sphere. The space between the two spheres is filled with two concentric layers of dielectric materials of permittivity ϵ_1 and ϵ_2 . The boundary between these two dielectric layers is located at a radius R . Calculate the capacitance of this capacitor. Also, determine the capacitance of an isolated metallic sphere of radius a surrounded by a spherical dielectric layer of radius R and permittivity ϵ .
6. A wire is bent as shown in the figure below. Determine the magnetic field at the point P (i.e., at the centre of the wire's circular turn of radius R).



[Additional problems for Graduate Students: Griffiths – 4.32 and 5.56]