PHYS 4392
Fall 2014
TE Coan
Due: 17 Oct '14 6:00 PM

Homework 7

1. A "pure" dipole of moment $\mathbf{p}$ is at the center of a spherical cavity of radius a inside a conductor. Find the electric field $\mathbf{E}$ in the cavity due to the induced charges on the cavity walls. The solution requires you remember something from chapter 3. This problem is less hard than you might initially think.

2. Consider a ring of negative charge $-q$ and radius a that lies in the xy plane. A charge of $+q$ lies inside the ring at $y = d$. Find the electric monopole and dipole moments of this system, and give an expression for the potential V to the same order. Hint: This problem require no integration if you keep your wits about you. It does require you recall an important fact from lecture (and Griffiths) about charge distributions, dipole moments and coordinate origins.