

PHYSICS 4175: Assignment #5

DUE: Thursday February 11, 2016

Problems:

1. Problem 3.26 on page 150
2. Problem 3.43 on page 162
3. Problem 4.37 on page 207
4. Charged Sphere

A perfect conducting sphere is centered on the origin with radius R , potential V_0 , and net charge Q . An ideal homogeneous isotropic linear dielectric with dielectric constant ϵ_r encases the conductor with an inner radius of R and outer radius αR . Embedded within the dielectric is a point charge $-2Q$ located at $\beta R \hat{e}_z$, where $1 < \beta < \alpha$.

- (a) What is the electrostatic potential everywhere in space?
- (b) What is the electric field everywhere in space?