

# PHYSICS 4175: Assignment #6

DUE: Thursday February 25, 2016

## Problems:

1. Problem 4.35 on page 206
2. Problem 4.36 on page 206
3. Problem 5.28 on page 248
4. Charged Cylinder

An infinite, along the z-axis, perfect conducting cylinder is centered on the origin with radius  $R$ , potential  $V_o$ , and net charge per unit length  $\lambda$ . A dielectric material with polarization  $\vec{P} = \hat{x}P_o$  encases the conductor with an inner radius of  $R$  and outer radius  $\alpha R$ .

- (a) What is the electrostatic potential everywhere in space?
- (b) What is the surface charge density on the conductor?