Homework 4

Due Monday 2/24/2014 - at beginning of class

Griffiths' 4 Problems

3.13 (Griffiths 3rd Edition 3.12)

3.19 (Griffiths 3rd Edition 3.18)

3.23 (Griffiths 3rd Edition 3.22) Work only up through P_3 not P_5.

Additional Problems

E.4.1 An infinite conducting cylinder of radius a is in an external electric field that is a uniform $E_0\hat{x}$ far from the cylinder. Compute the surface charge density as a function of ϕ on the surface of the cylinder.

E.4.2 The potential at the surface of an infinite cylinder of radius a is $V(a, \phi, z) = V_0 \cos(3\phi)$. Find the potential both inside and outside the cylinder. Find the field inside and outside and the surface charge density on the cylinder.