

Homework 3

Due Friday 2/8/2013 - at beginning of class

Reading Assignment - Chapter 2.4-2.5

Griffiths Problems, 4th Edition

Each problem should be started on its own piece of paper. Points will be removed from solutions that are difficult to read.

When the problem numbering is different between the 3rd and 4th edition of Griffiths, the third edition number is in parenthesis.

2.30 Parts (b) and (c) only

2.31

2.41 (Griffiths 3rd Edition problem 2.37)

2.42 (Griffiths 3rd Edition problem 2.38)

2.43 (Griffiths 3rd Edition problem 2.39)

2.48 (Griffiths 3rd Edition problem 2.44)

2.50 (Griffiths 3rd Edition problem 2.46) Find \vec{E} only.

Problem E.3.1 A spherical region $r < a$ contains a non-uniform volume charge $\Gamma = \gamma r^3$ where γ is a constant. Compute the field everywhere.

Problem E.3.2 A ring with radius a and constant linear charge density λ lies in the $x - y$ plane centered at the origin. Compute the electric potential at a point R along the z -axis.

Problem E.3.3 A ring with radius a and constant linear charge density λ lies in the $x - y$ plane centered at the origin. Compute the electric field at a point R along the z -axis.

Problem E.3.4 Two spherical shells of radius a and b , $a < b$, have uniformly distributed charges $Q_a = Q$ and $Q_b = -Q$. Compute the energy between the shells.