

# PHYS 3414 - Electricity and Magnetism- Homework Set 2

## Chapter 2 - Electric Fields

Due 12:30pm Wednesday January 30, 2008 at the beginning of class.

### Good's Problems

All problems must be worked from first principles by starting from Coulomb's or Gauss' Law.

2.8

2.12

2.14

2.16

2.18

2.22

2.28

2.30

2.34

### Additional Problems

**Problem A1** Re-work parts (a) and (b) of problem A1 of Homework 1 using the electric potential. If you already did it using the potential, congrats.

**Problem A2** The electric potential of a point dipole was given in lecture as  $V = kp \cos(\theta)/r^2$ . Compute the electric field. Sketch the field.

**Problem A3** Evaluate the integral

$$\int_V ((x-5)^2 e^{-3(z-5)} \nabla \cdot \left( \frac{\hat{r}}{r^2} \right) dv$$

over a sphere of radius  $R$  centered at the origin.

### UPII Problems

No UPII problems this time because many of the above are UPII problems.