

PHYS 333 — Problem Set #12

Reading: For problems, Section 4.1; for Monday's class, Section 4.2

Problems: Due Monday October 6

1. Griffiths 4.1
2. Griffiths 4.4
3. Griffiths 4.5 (Let's all agree on directions. Let $+z$ be up the page, $+y$ to be to the right, and $+x$ be out of the page.)
4. A dipole \mathbf{p} is a distance r away from a point charge q , and oriented so that \mathbf{p} is perpendicular to the vector \mathbf{r} from q to \mathbf{p} .
 - (a) What is the force on \mathbf{p} ? (Use the techniques of Section 4.1.3. I suggest working in Cartesian coordinates.)
 - (b) What is the force on q ? (Use the techniques of Chapter 3.)
 - (c) Compare the results of parts (a) and (b).
5. A dipole \mathbf{p} is situated at the origin and lies in the y - z plane. What is the *magnitude* of the electric field at a point \mathbf{P} situated on the z -axis?

