

**PHYS 621 – HOMEWORK # 8 – DUE FRIDAY, 10/30/2009**

**Problem 1.** Jackson problem 4.1

**Problem 2.** Jackson problem 4.2

**Problem 3.** A nucleus with quadrupole moment  $Q$  is placed in an external electric field  $\mathbf{E} = (E_x, E_y, E_z)$ . Show that the quadrupole contribution to the energy is

$$W^{(4)} = -\frac{e}{4}Q [\nabla_z E_z]_{\mathbf{x}=0}.$$

(For notations, see discussion below Eq. (4.24), Jackson Sect. 4.2.)