

P506

Problem Set #6

Due Oct. 19, 2010

1) Jackson problem 4.4

2) Jackson problem 4.6

3) A set of charge distributions is given by $\rho(\mathbf{x}') = C_n r'^n \cos \theta'$ for $r' < a$ else 0 for $r' > a$.

Here C_n are constants and n is a positive integer.

a) Calculate all multipole moments q_{lm} of these charge distributions.

b) What is the potential in the region $r > a$ for all of these distributions?

c) What is the electric field in the region $r > a$ for all of these distributions?