PHZ3113–Introduction to Theoretical Physics

Fall 2008

Problem Set 4

Sept. 12, 2008

Due: Wednesday. Sept. 17, 2008
Reading: Boas Chapt. 5, Secs. 6.1-6.4,10.5

1. Boas Prob. 4.11.4
2. Boas Prob. 4.11.10
3. Boas Prob. 4.11.12
4. Boas Prob. 4.11.13
5. The charge density on the sphere with surface $x^2 + y^2 + z^2 = b^2$ is given by $\sigma(x, y, z) = a\,xyz$, where a is a constant. If x, y, and z are the usual Cartesian coordinates, what are the *dimensions* of a? (not a trick question!). Find the point on the surface of the sphere where σ is a maximum.