



24.8200 Engineering Electromagnetics

ASSIGNMENT 2

Due Date: Thursday September 28, 2006

Instructor: J. LoVetri

Note: You can use any references you like, but make sure that your solutions are complete.

- 1) Integrate the equation $\nabla \times \nabla \times \mathbf{A} = \mu \mathbf{J}$ for the magnetostatic magnetic vector potential directly to find an integral expression for the field inside a volume V bounded by surface S . What boundary conditions will be required on S . Show all steps and state all assumptions. (A classical derivation for this problem is available in Stratton §4.15)
- 2) Find a mathematical expression for the electrostatic force on a point charge, q , located inside a neutral conducting spherical shell of radius b , which is infinitely thin. The charge is located a distance $a < b$ from the centre of the sphere. What is the charge density on the spherical shell. Show all steps and state all assumptions.

