ENEE 680: Homework #1

Due: Wednesday Sept. 14, 2016

Zangwill: Problems 1.3a, b, 1.4 a, b You need not use the Levi-Civita symbol if you have an alternative approach.

3.4, 3.5, 3.11 Hint: the answer to c) is $\sigma R / (\pi \varepsilon_0)$ and this can be used to solve d), 3.13 3.15, 3.16, 3.17

Also,

\textbf{Prob A)} The potential surrounding a point charge, $q$, located at position $x_0$ in a plasma is given by,

$$\Phi_0(x) = \frac{q \exp(-|x - x_0| / \lambda_d)}{4\pi \varepsilon_0 |x - x_0|},$$

where $\lambda_d$ is known as the Debye length.  a) Find the charge density induced in the plasma.  b) Show that it is proportional to the local potential.