PHYSICS 507
2nd HOMEWORK
Dr. V. Lempesis

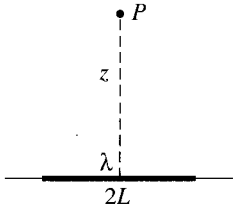
Hand in: Tuesday 10th of March 2015, time: 23:59

Student Name : _____

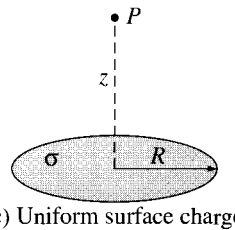
Student ID: _____

Each question gets 20 marks for full answer

1. Find the potential at a dsitance z above the centre of the charge distributions. In each case compute $\mathbf{E} = -\nabla V$.

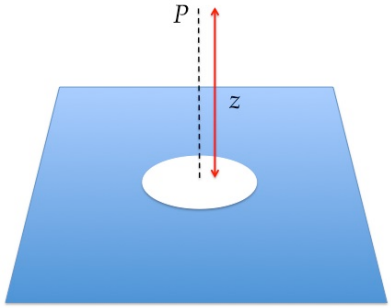


(b) Uniform line charge



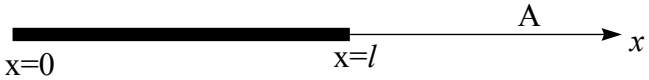
(c) Uniform surface charge

2. An infinite sheet is charged with a positive surface charged density σ . We open a circular hole of radius R as shown in the Figure. Find the electric field at a distance z above the center of the hole.



3. Use the formula $V(\mathbf{r}) = \frac{1}{4\pi\varepsilon_0}\int \frac{\lambda(\mathbf{r}')}{r} d\mathbf{r}'$ to find the potential a distance z on the axis of a ring of charge of radius R.

4. A rod of length l is uniformly charged with a linear charge density λ . Find the electric potential at point A, which is at a position x .



5. In the problem 4, calculate the electric field at point A.