PHY102: Assignment 4

1. Four identical electric point charges are located at $(1, 0, 1), (0, 1, 0), (-1, 0, 0)$ and $(0, -1, 0)$. Find the electric field at the origin and at $(0, 0, 1)$.

2. Find the electric field for an infinite line charge distribution with a constant charge density λ at a distance d from the distribution. Use Coulomb's law.

3. Suppose the $x - y$ plane is electrically charged with a constant charge density σ. Find the electric field at a hight h from the $x - y$ plane. Use Coulomb's law.

4. Solve the problem no. 2 using Gauss's Law.

4. Solve the problem no. 3 using Gauss's Law.

5. Suppose we are leaving in a two dimensional world (*i.e.* there is no z direction/axis). Assuming that $Gauss's$ law is valid in this world, find the electric field at a distance r from for a point charge q. Is the answer same as what we studied in class?