In this lab you will map contours of equal electric potential near conducting metal electrodes. The electric fields near the electrodes will be found from these equi-potentials.

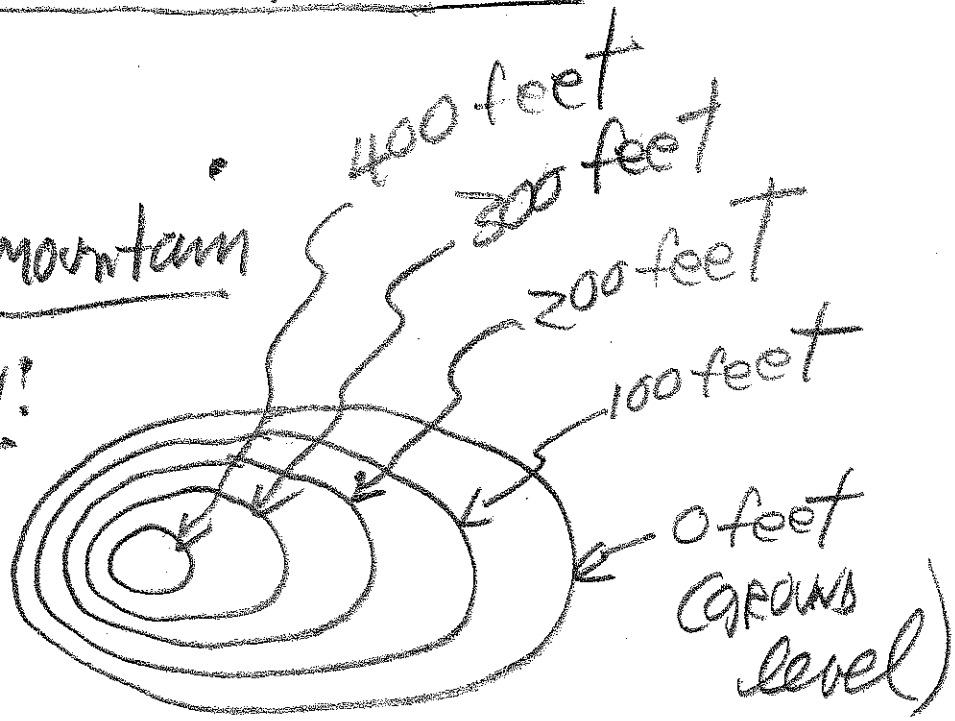
Equipment: Field mapping tray with water; wires; one voltage source; two voltage meters; Cartesian graph paper.

Procedure

1. See model set up of the lab with instructor comments. The poles should *not* be at opposite ends of pan near the edges. They should be about 8 cm or so from each other on central meridian. Check with your instructor on pole-to-pole distance
2. Draw the electric dipole configuration on the sheet of graph paper.
3. Place the stationary probe at a general point on the grid area which serves as the *reference* potential.
4. Place moveable probe in the conducting water at some spot a significant distance from the stationary probe. Move the probe until the galvanometer or voltage meter gives a zero reading.
5. Locate a series of 8 or 10 points of the same potential (zero reading) across the field region and draw a dashed lined curve through these points on the graph paper.
6. Choose a *new* location for the *reference* probe 3 or 3 cm from the previous reference position and locate another series of equi-potential points; draw a dashed lined curve through these points on the graph paper.
7. Repeat steps 3 to 6 and draw several equi-potential lines.
8. Map the electric field lines using theory presented in class and textbook.

HINTS

prelab question 1:



top view!

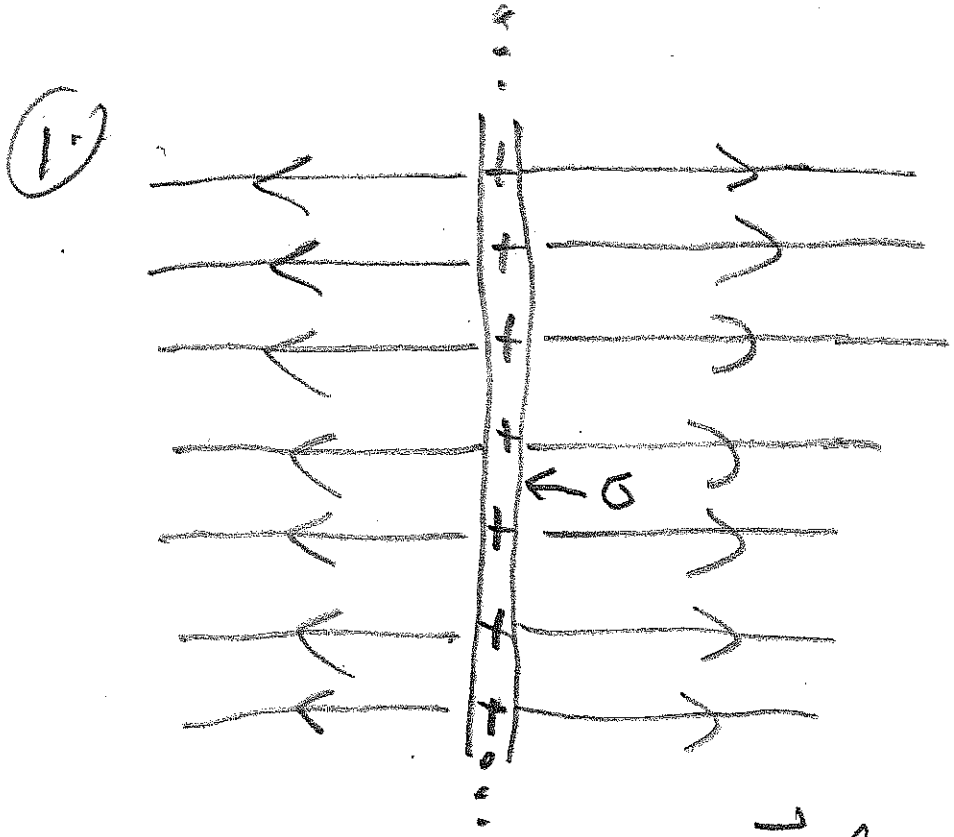
↓ draw side view

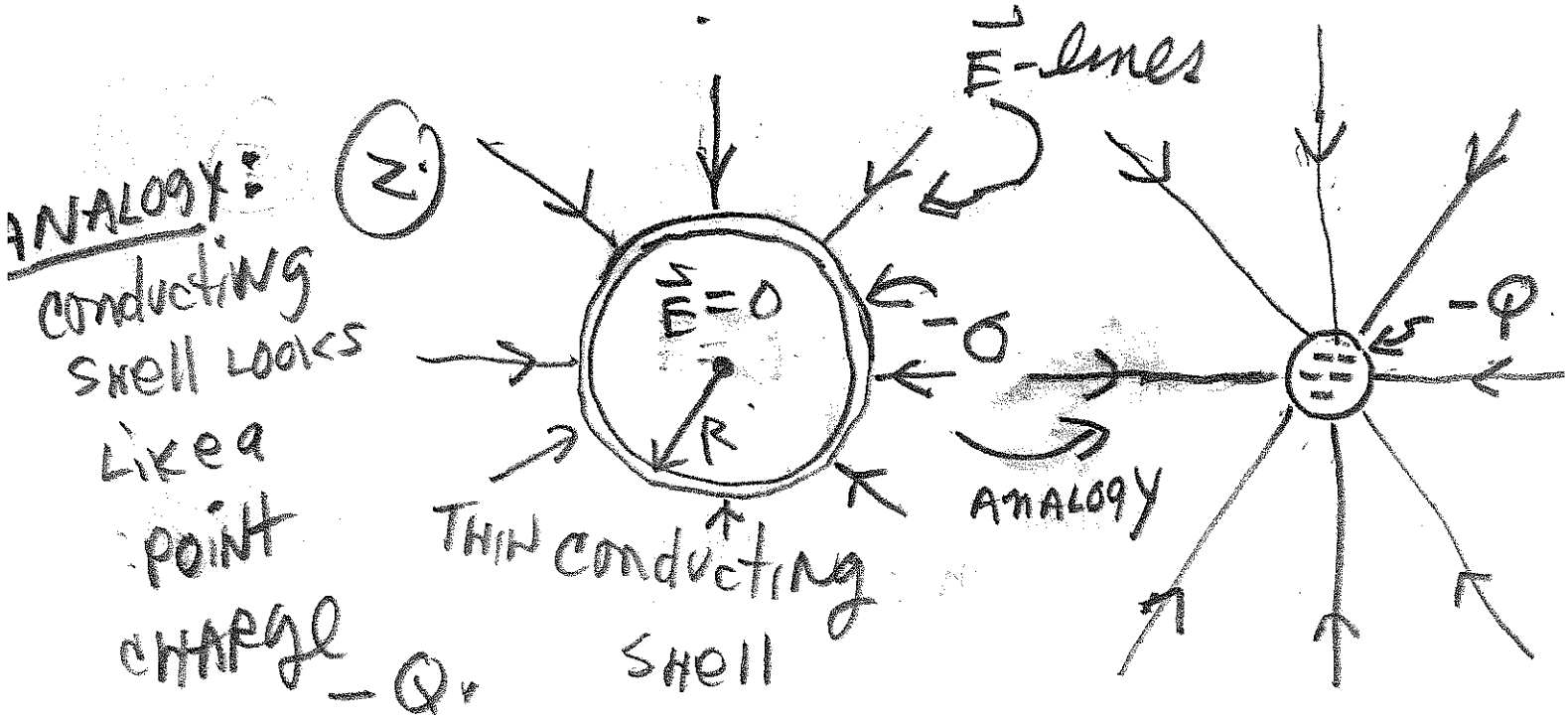
DRAW SIDE VIEW!

GROUND level

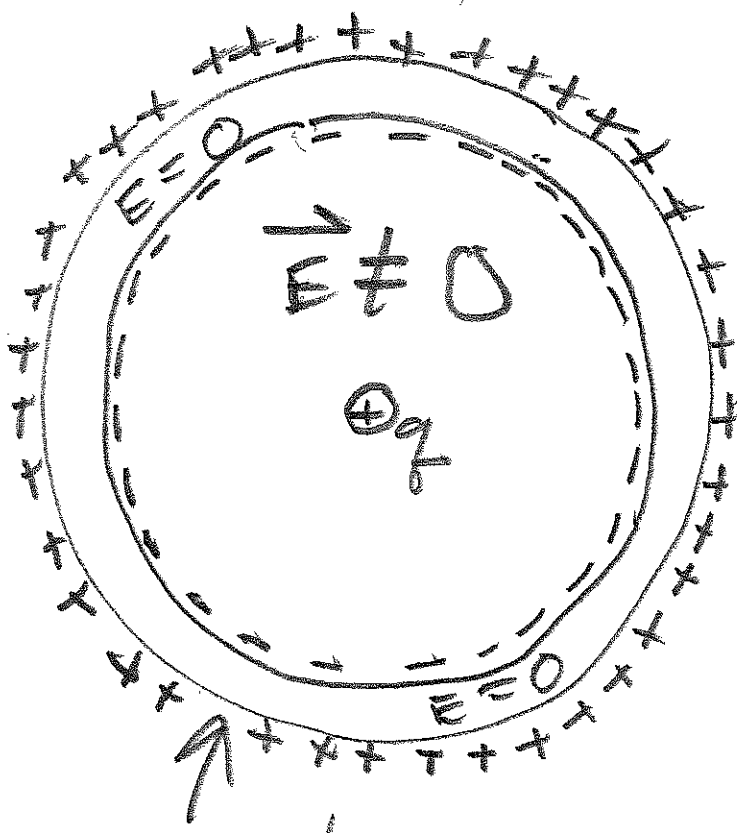
HINT: on side view, EXPERT SIDE is steep; beginner side is LESS steep (aka gradual rise to top)

Prelab question 2
(Exercise 2)





(3.) $\vec{E} = 0$ INSIDE WALLS of SHELL



conducting SHELL with a POINT CHARGE q AT center.

q induces negative CHARGE on inner SURFACE (WALL)

Prelab exercise 2:

(3.)