

Equipotential lines and Electric Fields

READING ASSIGNMENT:

To Prepare for this lab Equipotential Lines and the Electric field: Read objective and discussion of the lab page 5, then read/study in your text sections 21-6,21-8,21-9,23-1, 23-3, 23-5 You may not understand the fine points on the initial read of chap 23 sections but try to get the general idea. Check out main formulas in the summaries of chap 21 and 23. Pay particular attention to the images of field lines and equipotentials. Fig 21-34 in 21-8 and Figs 23-16,17,18. Most important is that the electric field lines are perpendicular to the equipotentials. see figures and related discussion

NOTE: KEEP TRACK OF THE VALUE OF THE VOLTAGES USED in the experiment for each equipotential line

PREPARATION QUESTIONS TO HAND IN ON THE DAY WE DO THE EXPERIMENT: NO VALUE AFTER!

be as detailed as the questions and problems require.

1. Define electric field?
2. Define electric potential?
3. What is the formula relating the force F and electric field E on a charge q ?
4. Given a charge Q what is the formula for the Electric field E at a distance r from the charge?
5. Give a charge Q what is the formula for the electric potential V at a distance r from the charge?

PROBLEMS: TO ADD TO THE end of your LAB REPORT: Do not hand in as a prep! SHOW all formulas for credit in your report

1p. An objects has a CHARGE = 5 TIMES THE ELECTONS CHARGE(e) AND IT EXPRIENCES A FORCE OF 170,000 NEWTONS WHAT IS THE ELECTRIC FIELD STRENGH FOR THIS SITUATION

2p. The electric field in Question 1p comes from a point charge about 0.5 meters from the object ($5e$). What is the point charge value

3p. What is the electric potential due to this point charge Q at the position $r=0.5$ m. see pages 612-613 in your text