

Electric Potential Lab

Procedure

Briefly, but completely, describe the procedure for this lab – and include labeled sketches.

Data

Collect data directly on your graph worksheets.

Graphs

Use grid paper to plot the position of your conductors. Plot enough potential values to find the 1V, 2V, 3V, 4V, and 5V equipotential lines. Draw the equipotential lines in, as smooth curves (don't "connect the dots"). Be neat! Use different colors for each line, and make sure to label the lines and title your graphs.

Questions

- 1) Choose one of these two conductor arrangements.
 - a) Describe the arrangement of the equipotential lines using two aluminum plate conductors. Be thorough, but in particular, how did they look in the region between the conductors versus near the ends, and were your equipotential lines equidistant? Why, or why not?
 - b) Describe the arrangement of the equipotential lines using two copper ring conductors. Be thorough, but in particular, did your equipotential lines follow a $1/r$ drop off? Why, or why not?
- 2) Describe the arrangement of the equipotential lines using one copper ring and one aluminum plate. Be thorough.
- 3) Draw 6 electric field lines into each of your graphs. Be sure to make the direction of your lines evident and use the entire graph, not just down the center. What rules, if any, did you use to draw these lines accurately?
- 4) Find the spot, using your graph, where the field is the greatest and calculate the magnitude of the field at this spot. Show your work. How did you find this location? Clearly indicate this spot on your graph.
- 5) Imagine an electron, initially at rest, starting at one conductor and moving to the other.
 - a) Which conductor would it start at, and which conductor would it end up at?
 - b) What is the change of potential energy for this movement?
 - c) What speed would the electron have when it reached the other conductor?
 - d) Does the speed change if the electron travels along a longer field line? Why, or why not?

Error Analysis

Thoroughly explain what the main sources of error are for this lab, and how you would correct them.