

Magnetic Forces II

Name: _____ Date: _____

Instructor: _____

Teammates

1.- _____ 2.- _____

3.- _____ 4.- _____

Instructions: Follow the steps on this worksheet, using your lab manual as a guide, unless directed to do otherwise by your lab instructor. Show at least one sample calculation for each step. Box final mathematical results. Do not forget the units.

Take $q_e/m_e = 1.758820150 \times 10^{11} \text{ (C kg}^{-1}\text{)}$ as the accepted value for the electron's charge-to-mass ratio. Follow the procedure in the manual to set up the apparatus and check with your TA before you start your measurements.

Data

Record the Diameter of the Coils and the Number of loops per coil:

D = _____ N = _____

Follow the manual instructions to collect your data, but use the currents given by your instructor.

Arrange your observations of Voltage and corresponding diameter of the electron's track in a table with headers and units. Include a column to index the number of observations.

Analysis

1. For each current used, calculate the magnetic field.
2. Using your observations, determine q_e/m_e for each voltage and add your results to your Data table.
3. Determine the average value for q_e/m_e .
4. Make a scatter plot of your results for q_e/m_e . Include a horizontal line to represent the average value. Your plot should have a title and labeled axis with appropriate units.
5. Look at the values that you have plotted and assess if their average is an acceptable representation for all of them. Write a short explanation to support your assessment.

