Name:________________________________ Partner:___________________________ PH2223 -____

Experiment Sheet for Magnetic Deflection of Electrons

1. Record your accelerating voltages: V_C = ______________, and V_B = ______________.

2. This results in V_{acc} = _______________ and a velocity of v = _________________.

Recall that the mass of an electron is $9.11X10^{-31}$kg. Show your calculation for v in the space below.

3. What did you get for Earth's magnetic field? B_{Earth}= _________________.

*Note if you got a value larger than the theoretical then it could have been due to the B-fields coming from your power supply. Show your calculation for B_{Earth} in the space below.

4. For ease of data collection it's recommended that for the next part of the lab you use set amounts of deflection and measure the corresponding potential. So starting at V = 0 gradually increase your potential until your dot is centered 1/16 of an inch from its initial position then record the potential. Continue to do this for 2/16 of an inch and so on. These 1/16" increments happen to be the same increments on the CRT screen. Also be sure to convert inches to meters. Record all of your data (for both the positive and negative y directions) in the following tables.

y (in)	y (m)	V (V)
1/16		
2/16		
3/16		
4/16		
5/16		

y (in)	y (m)	V (V)
-1/16		
-2/16		
-3/16		
-4/16		
-5/16		

5. Use a separate sheet of graph paper to graph *y* vs. V.

6. Approximately what was the graphical relationship between y and V? __________________
(possible answers include: squared, exponential, linear, inverse, and exponential decay)

7. From your graph find the mathematical equation relating y and V. ______________________
(for example: $y = 2.3V^2$ would be an equation relating y and V)
Show your work for deriving your equation in the space below.

8. Explain why there would be a similar relationship between y and I (as there is between y and V).