Expt. 4 Rubric

Note: Always credit the work of others (i.e. write your lab partner’s name at the top of your report)

Note: If you used Excel to do any of your calculations, print out the spreadsheet and neatly cut and paste it into your report. All data and calculations must have labels.

Introduction: Statement of the problem. Write a brief summary of procedure. Include all major equations used in your calculations. Be clear and brief! (Minus 1 point for not doing this part)

Measurements and associated uncertainties or standard deviations (and a brief discussion of their associated uncertainties).

Calculations/Error Analysis: Kappa and its uncertainty, V_calc and its uncertainty for each applied voltage.

Graph of V_calc vs. V_expected

(Graphs of course need descriptive titles; axis labels with units; error bars; a legend or labeling for multiple data series or fitting lines.)

Before plotting V_calc vs. V_expected, what kind of relationship do you expect between V_calc and V_expected. Call this your “expected distribution”. Be explicit (i.e. Where should the curve intersect the axes? What shape should the curve have? Etc...)

Plot V_calc vs. V_expected. Also plot vertical error bars.

What kind of relationship do you see between V_calc and V_expected?

Using the type of curve of your “expected distribution,” do a least-squares fit by hand (show your work) using the method described in the experimental guidelines. (Do not just use Excel to determine the best fit curve.) Then plot and label your least-squares fit curve on your graph of V_calc vs. V_expected.
Conclusion/Discussion:

Calculate $\chi^2$ (Chi-squared) and the reduced chi-squared. Determine the probability of acquiring a reduced chi-square larger than the value you calculated. What does this tell you about the agreement between your data and the type of curve you fit to your data? Should you reject your least-squares fit curve? If so, at what significance level do you reject your least-squares fit curve?

If you had discrepant results, discuss the sources of error and try to trace what is the most significant contribution to the error in your results. Explain why you believe this is the most significant source of error.  
**Note:** Even if you didn’t have to reject your least-squares fit curve, consider whether your least-squares fit curve is discrepant from the “expected distribution” and, as always, state the major sources of random/systematic error and how you did/could reduce them.

**Note:** “Human error” conveys no useful information.