

Exam 5, Part I
CHEM 222, Spring 2021
25 Points

Name(s) _____
Due by 12:00 noon, February 15, 2021

You may complete the following individually, or with one (1) partner. You may use your textbook and notes, but may not receive assistance from your classmates or anyone other than Dr. Lamp. This signed sheet must accompany the completed assignment. By signing below, you certify that you completed the problems in accordance with these rules. No credit will be given to unsigned papers.

Signature(s) _____ Date _____

For this assignment, prepare a spreadsheet program that will allow you to calculate the least-squares line for a small data set (between 3 and 10 data points) for use in the analysis of laboratory results. The spreadsheet must:

1. Allow you to enter a series of x,y data points, as well as a y-value for an unknown.
2. Output the equation for the least-squares line (m and b), including absolute and relative uncertainties (s_m and s_b) as well as 95% confidence intervals for the slope and intercept and the R^2 for the fit. These must be clearly labeled in your spreadsheet.
3. Provide a plot of the data and the resulting line.
4. Calculate an x-value for the unknown measurement, with associated absolute and relative uncertainty (s_x) and 95% confidence interval. These must be clearly labeled in your spreadsheet.

Use the data below to illustrate the operation of your spreadsheet:

x	Concentration (mM)	1.04	5.20	10.40	26.00	52.00	104.00
y	Instrument Response	0.020	0.094	0.240	0.490	1.100	2.020
y _{unk}	Response for Unknown	0.241					

*NOTE: Make the spreadsheet as general as possible, it must produce reasonable results for between 3 and 10 data points by simply entering the x and y values and the y value for an unknown! You may find it useful to investigate some of the built-in functions of your software (such as SLOPE, INTERCEPT, DEVSQ, SUMIF or ISBLANK) to make life easier. **Do not use Excel's LINEST function, it will limit the utility of your spreadsheet.***

Requirements: You must submit to me both a hardcopy of your spreadsheet output using the data above, and an electronic copy of the spreadsheet file. The file must be uploaded to Blackboard. Include your last name(s) in the filename in the form: "name ex5pt1" or "name1 and name2 ex5pt1".

Grading Criteria: As I grade, I will be comparing your results for the sample data with the "true" values. I will also be testing the utility of your spreadsheet by entering a second data set (which will have between three and ten data points) and examining the output of your file. *Remember, I should be able to simply enter the x and y data and y unknown and get out reliable results.*