

Name: _____

Date: _____

Lab Partner: -----none for this assignment-----

Lab Section: _____

Lab Report: Using Excel for Graphical Analysis of Data

Note: Only two graphs are required to be submitted with this report – the graphs prepared for Part 1 and Part 5.

Part 1: Simple Linear Plot

- Which set of data is plotted on the y-axis? _____
the x-axis? _____
- Record the following information:
The equation of the fitted trendline _____
The value of the slope of this line _____
The value of the y-intercept of this line _____
- Is the fit of the trendline to your data good (circle one)? Yes / No
Briefly explain your response.
- Determine the temperature (in K) of the gas in the cold room when it has a measured volume of 10.5 L using
 - a) Extrapolation and “eyeballing” _____
 - b) The equation of the trendline _____
Show your calculations for b) below.
- Attach a printout of your graph to this report. Be sure that your axes are properly labeled (with units), that the line equation is visible, and that your graph has an appropriate title.

Part 2: Using Functions

- Which set of data when plotted yields a straight line (circle one)?
Time vs. $\ln(\text{Temp})$ Time vs. $(\text{Temp})^{0.5}$ Time vs. $(\text{Temp})^{-0.5}$
- Record the following information concerning the linearized data:
The equation of the fitted trendline _____
The value of the slope of this line _____

Part 3: Two Data Sets and Overlay

- Record the equations of the trendlines fitted to

Data set A: _____

Data set B: _____

- Perform a simultaneous equations calculation to determine the x and y values for the point of intersection between these lines. Show your work below.

Part 4: Choosing Correct Parameters for Graphing

- Consider the linearized equation below, which relates the rate constant (k) of a hydrolysis reaction to temperature (T):

$$\ln k = -\frac{E_a}{R} \left(\frac{1}{T} \right) + \ln A$$

Which term in this equation corresponds to y? _____

x? _____

m? _____

b? _____

- Use the appropriate functions to manipulate the data provided and create a linear plot. Then record below the equation of the fitted trendline below.

Equation: _____

- Show your complete work in the spaces provided. Using the data obtained from the equation above, determine:

a) the value of E_a (in kJ/mol)

b) the value of A (in s^{-1})

Part 5: Statistical Analysis and Simple Scatter Plots

- For the College #1 data set, record the following values (determined using Excel):
the mean SO_4^{-2} concentration _____
the median SO_4^{-2} concentration _____
the standard deviation in the data set _____
- Calculate the standard deviation in the College #1 data set *by hand*. Show your work below.

- Are there any outliers in the College #1 data set (circle one)? Yes / No

If yes, which measurements are the outliers? _____

Show the calculations you used to identify the outliers (or, if none, how you determined that there were none).

Re-calculate the following values (using Excel) *excluding the outliers*:

the mean SO_4^{-2} concentration _____
the median SO_4^{-2} concentration _____
the standard deviation in the data set _____

- Create a scatter plot showing both the College #1 and College #2 data. Attach a printout of your graph to this report. Be sure that your axes are properly labeled, and that your graph has an appropriate title.
- Examine your plotted data. Which data set:
has the larger standard deviation? _____
contains the more precise measurements? _____