1: Using Excel for Graphical Analysis of Data (Experiment) – Chemistry LibreTexts

Lab Report: Using Excel for Graphical Analysis of Data

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Date: September 5, 2020 Lab Section: CHM 3120L U02

Turn in the graphs you made for ALL three parts in this assignment.

For each graph, make sure the following components are in the printout:

1. Title for the graph
2. Labels for x and y axes (along with appropriate units when applicable)
3. Line equation and R^2 when appropriate

PART 1: Simple Linear Plot

- Which set of data is plotted on the y-axis?
  - Volume (L)
- Which set of data is plotted on the x-axis?
  - Temperature (K)
- Record the following information:
  - The equation of the fitted trendline: y=0.1078x-8.0933
  - The value of the slope of this line: 0.1078
  - The value of the y-intercept of this line: -8.0933
- Is the fit of the trendline to your data good (circle one)? YES / NO. Explain why you think the line is a good fit to the data.
  - Yes, all the data points are linear and the points align in the best fit trendline.
- Determine the temperature (in K) of the gas in the cold room when it has a measured volume of 10.5 L using:
  - Extrapolation and "eyeballing": 180 K
  - The equation of the trendline (show your calculations below): 172.47 K

PART 2: Two Data Sets and Overlay

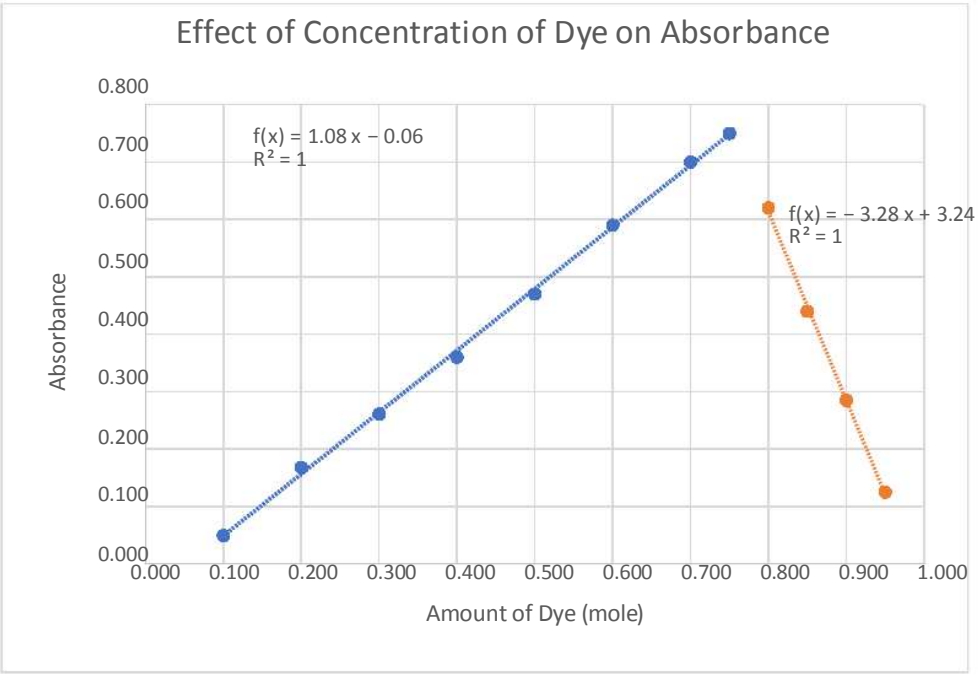
- Record the equations of the trendlines fitted to
  - Data set A: y=1.076x-0.059
  - Data set B: y=-3.28x+3.2375
- Perform a simultaneous equations calculation to determine the x and y values for the point of intersection between these lines. Show your work below:

Data set A:

To Find x: To Find y:

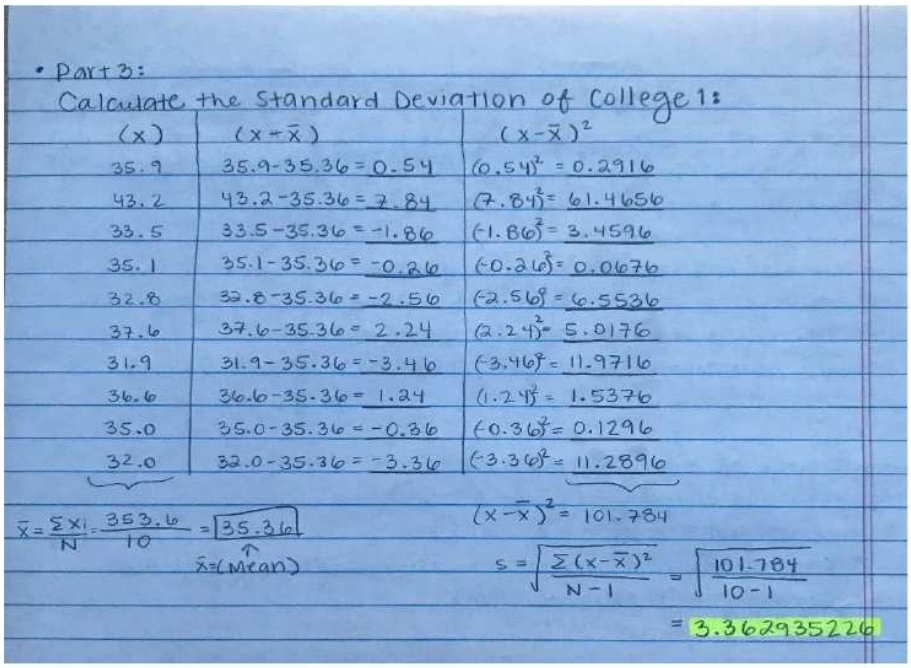
x=0.756

Scatter Plot for Part 2:

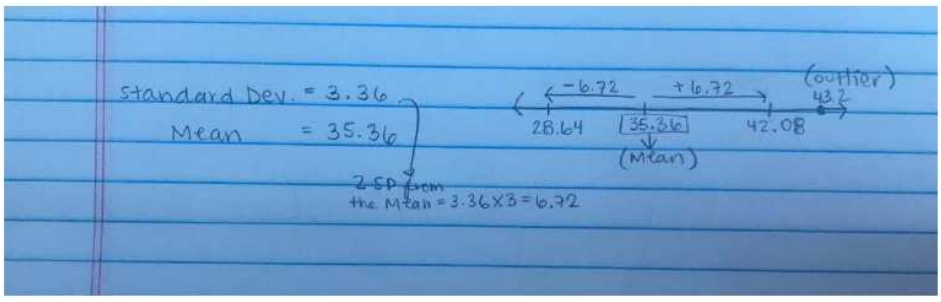


PART 3: Statistical Analysis and Simple Scatter Plots

- For the College #1 data set, record the following values (determined using Excel):
  - The mean SO_4^{-2} concentration: 35.36
  - The median SO_4^{-2} concentration: 35.05
  - The standard deviation in the data set: 3.362935
- Calculate the standard deviation in the College #1 data set *by hand*. Show *all* your work below. Continue your work on an attached page if you require more space.



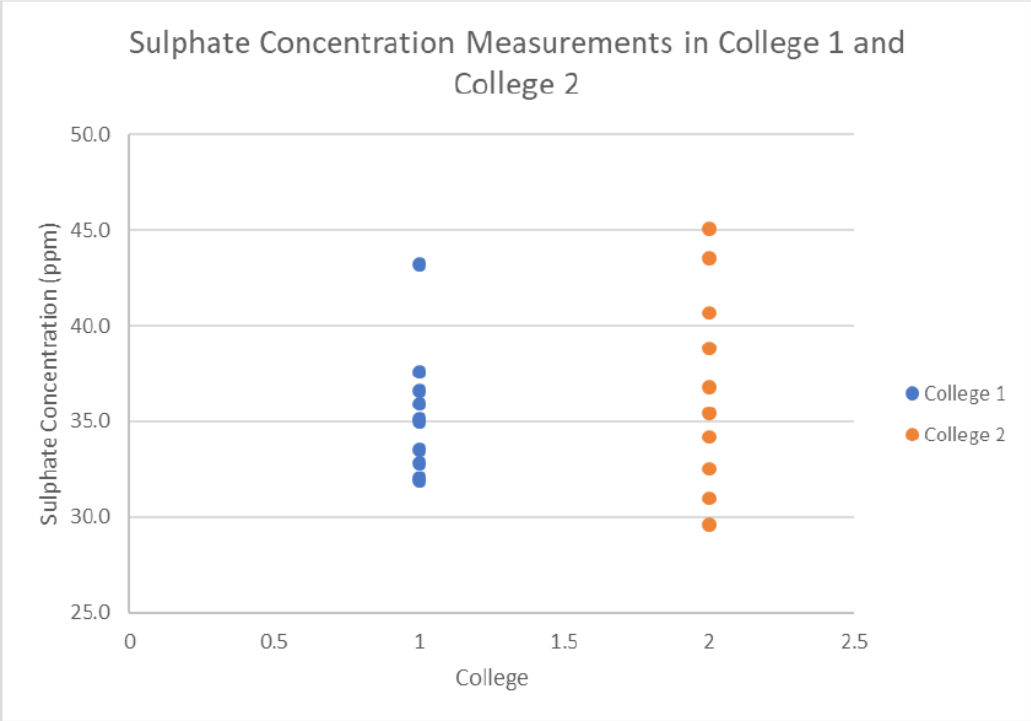
- Are there any outliers in the College #1 data set? YES / NO
- If yes, which measurements are the outliers? 43.2
- Show the calculations you used to identify the outliers (or, if none, how you determined that there were none).



- Re-calculate the following values (using Excel) *excluding the outliers:*
  - The mean SO_4^{-2} concentration: 34.49

- The median SO_4^{-2} concentration: 35.0
- The standard deviation in the data set: 2.045999

- 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 a larger standard deviation? College 2
  - Contains the more precise measurements? College 1