

Intermediate Laboratory: Homework 6

Due: 14 March 2024

In each of the following problems you will need to compute terms such as

$$\sum_i x_i \quad \sum x_i y_i \dots$$

To do this set up an Excel spreadsheet with the given data and use the spreadsheet to plot the data and compute the various sums that are needed. You should print out the table in the spreadsheet and attach it to your assignment.

1 Taylor, *Error Analysis*, 2nd ed., 8.2, page 199.

2 Taylor, *Error Analysis*, 2nd ed., 8.7, page 200.

3 Taylor, *Error Analysis*, 2nd ed., 8.20, page 204.

4 Heat capacity of water

The data from my calorimetry experiment which aimed to measure the heat capacity of water is given below. Here m_w is the mass of the water and C_{tot} is the heat capacity of the water plus the calorimeter.

m_w in g	C_{tot} in J/°C
70	332
116	542
123	563
144	641
147	681

Theory predicts that C_{tot} and m_w are linearly related. Use a least-squares fit to find the relationship between these and to determine the heat capacity of water. Include uncertainties.