Using Microsoft Excel

Data analysis is an important part of chemistry. The Plotting Tool, found in the menu on any screen of the CD-ROM that accompanies the 5th edition of Chemistry & Chemical Reactivity, is an easy-to-use program for plotting data. However, Microsoft Excel is perhaps the most widely used software for data analysis. The directions that follow outline the use of Excel to prepare a plot of laboratory data, to obtain an equation relating the data, and to obtain the slope of the straight line that results from data plot.

On opening Excel, you will first see a blank sheet consisting of “cells” into which data can be entered. The picture you see here is of a worksheet into which data is entered into two columns labeled x and y.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>x</td>
<td>y</td>
</tr>
<tr>
<td>2</td>
<td>2.1</td>
<td>1.1</td>
</tr>
<tr>
<td>3</td>
<td>3.9</td>
<td>4.1</td>
</tr>
<tr>
<td>4</td>
<td>5.96</td>
<td>6.1</td>
</tr>
<tr>
<td>5</td>
<td>8.12</td>
<td>7.95</td>
</tr>
</tbody>
</table>

To plot these data, you will find it most convenient to use the “Chart Wizard.”

Clicking on the Wizard will open a dialog box from which you can choose the type of plot. Generally you will want to choose an “XY Scatter” plot as seen in this example.

Clicking on the “Next” button will lead you through a series of steps in which you can label and format the graph axes.
The chart created with the data in our example is shown here.

![Sample Data](image)

Now that your data are plotted, there are generally three important pieces of information you will want:

a) What is the best straightline through the data points?

b) What is the equation of that straightline?

c) What is the slope of the straightline? That is, how does $y$ vary as $x$ changes, $\Delta y/\Delta x$?

In Excel the best straightline through the data points is called a “trendline.” Go to the “Chart” menu item at the top of the screen and select “Trendline.” When the “Trendline” dialog box opens, select linear under “Type” and under “Options” select Display equation on chart.
The chart that results is shown here.

The equation that describes the straight line relation between $x$ and $y$ is

$$y = 1.1135x - 0.7771$$

This is an equation of the type

$$y = mx + b$$

where $m$ is the slope of the line and $b$ is the intercept of the line when $x = 0$. Here the slope is 1.1135 and the y-intercept is −0.7771.

For more information on plotting data, see Chapter 1 of *Chemistry & Chemical Reactivity*, 5th edition.