MATH 360

Computer Orientation

This handout covers the use of Microsoft Word and Excel when creating project reports. Both pieces of software are quite powerful and only a few of their capabilities are shown here.

Microsoft Word

1.1 Spelling, grammar, and the thesaurus. When **Word** starts, it shows a blank document. Use the keyboard to enter text. Suppose you do not know how to spell a particular word, say machivelian. If it is incorrectly spelled, it will be underlined by a red wavy line. Right click on the word and some possible correct spellings will be given. Choose Machiavellian and it will appear in the text. You may double click on any word to select it and then right click and go to synonyms to find words with similar meanings. You can also select the Thesaurus for more similar words.

1.2 Editing Basics. You may select text by clicking and dragging, words by double clicking, or paragraphs by triple clicking. You may copy selected text into the clipboard using Ctrl-C, and then paste it using Ctrl-V. Alternatively, you can delete selected text and send it to the clipboard using Ctrl-X. To undo edits, use Ctrl-Z and to repeat edits, use Ctrl-Y. You can save the whole document using Ctrl-S

1.3 Formatting basics. Text may be made **bold** by selecting and using Ctrl-B, italicized using Ctrl-I, or underlined using Ctrl-U. All of these can also be done via buttons near the top in the title bar. You can also adjust font size

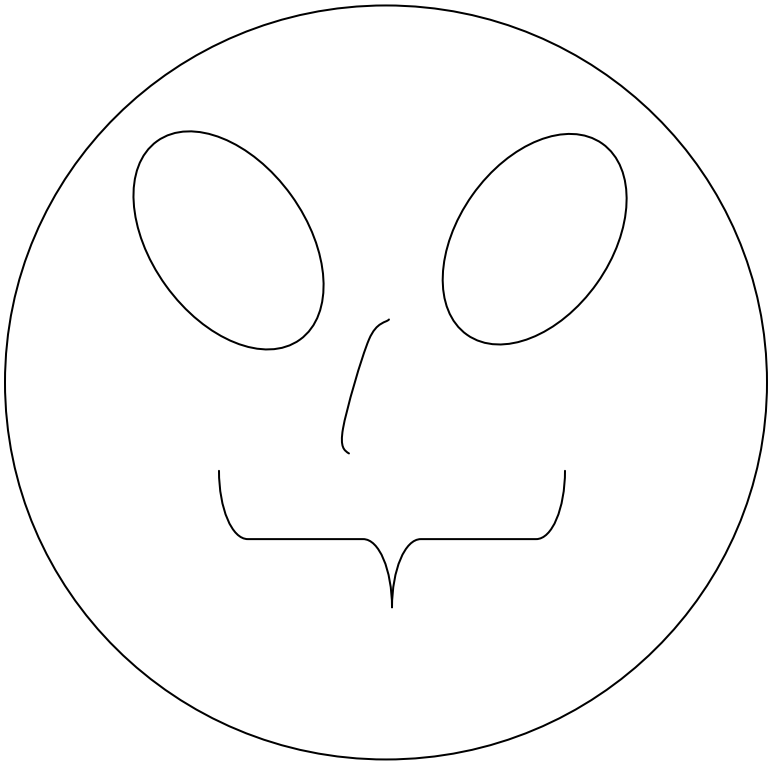
and type via the title bar (under Home). Similarly, paragraph layout: centering, left or right justification, etc. can be done.

1.4 Mathematical Expressions. It is possible to create mathematical equations by going to (Insert) in the title bar and choosing (Equation). Try to insert the expression

$$\int_{\alpha}^{\beta} \frac{e^{x^3}}{\sqrt{1-x^4}}\, dx$$

into your document.

1.5 Drawings. Use (Insert) (Shapes) to get a picture similar to the following into your document.



Microsoft Excel

2.1 Spreadsheets. Spreadsheets collect data in a rectangular grid. The rows are numbered 1 on up and the columns are identified by letters A and up. If more

than 26 columns are required, they are designated with two letters (AA, AB, etc). Furthermore, there are typically three sheets per document.

2.2 Data and Formulas. Each cell in a spreadsheet can hold data or a formula. Data can either be text (such as a name) or numerical. Formulas refer to cells with numerical data and start with an equal sign (=). Do the following: Put 36 in the cell at A1. Then, in A2, enter the formula =A1+7. Immediately, you should see 43 appear in A2. Now, go back to A1 and replace the value with 45. When you hit enter, the values in **both** A1 and A2 should immediately change with A2 having the value 52 now.

2.3 Copying Formulas. For this exercise, put 45 in cell A1 and 20 in cell B1. Put formula =A1+7 into A2. Now, after clicking in A2, drag the small black square in the lower right corner to the right (to cell B2). A2 should now have 52 in it and B2 should now have 27 in it. Now, with a dark border around both A2 and B2, drag the small square down to line 26. The whole rectangular region should fill with numbers. What happened?

The formula in A2 was copied to B2 as =B1+7. The letter was increased during the copy. Then, when we copied down, the formula in A3 became =A2+7 and that in B3 became =B2+7. This allows a large amount of data to be created very quickly.

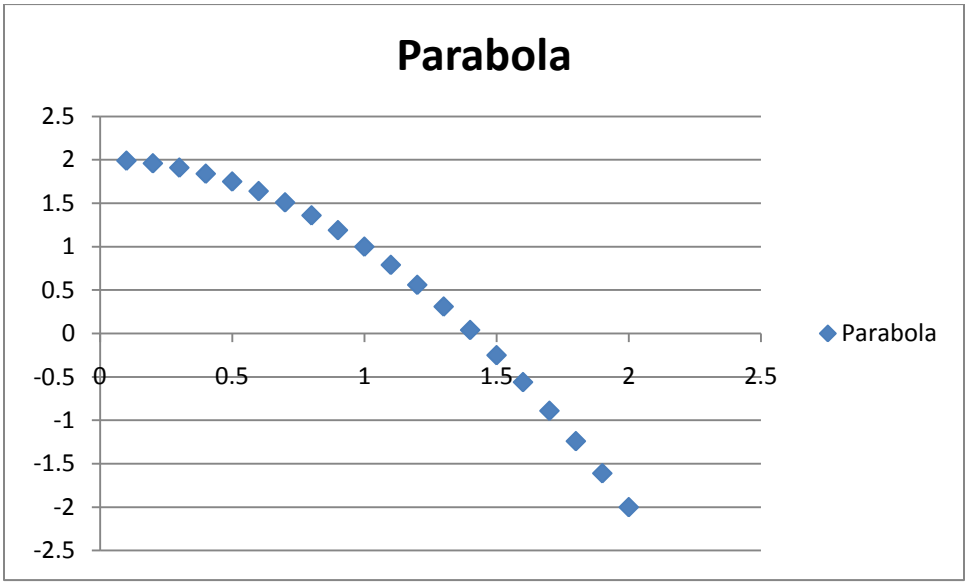
2.4 Fixing a row or column while copying. For this exercise, put 45 in cell A1 and 5 in cell B1. We want to create a column that starts at 45 and adds 5 each stage as we go down. Clearly, we want A2=A1+B1. This will give us 50 in A2, as desired. But if we copy this formula down, we obtain a column with 50 in each spot. Investigating, we find the formula =A2+B2 in A3. Since B2=0 (no value is there), this is no good. We want to have A3=A2+B1. To get this, we want to 'fix' the 1. This is done with a dollar sign ($). So, put the formula =A1+B$1 in A2 and copy downwards. Now, we should get what we wanted.

We can also fix a column in the same way: us $B2 to fix column B but allow the row (2) to change. Use B2 to fix both the column and the row in a formula.

2.5 Graphing. For the next exercise, put .1 in A1 and 1 in B1. Put =A1+.1 in A2 and =2-A1*A2 in B2. Now, select both A2 and B2 and drag down, copying until you get to row 20. Do not use the small square when selecting! Now, go to the side and (Insert) a (Scatter Chart) with only markers. Right click inside the rectangle and choose (select data). On the left, choose (add). Make the 'Series Name' Parabola. Then, click in 'Series X values' and select cells A1 through A20. Now click in 'Series Y values' and select cells B1 through B20. Hit (OK) twice and see the graph of $y = 2 - x^2$.

2.6 Copying Graphs. Finally, click on the border of your graph and select (copy). Go to your **Word** document, find a clear area, right click, and select (paste)

To put the graph in your document.



2.7 Random Numbers. Random numbers can be generated by using the formula =rand(). This will give an evenly distributed random number between 0 and 1. Use this to make a list of 20 random numbers. Then use the auto-sum feature (under formulas) to add them all (or use =sum(range)). What is the expected value of this sum? Explain.

0.1	1.948327
0.2	2.297086
0.3	2.496103
0.4	2.662918
0.5	3.036963
0.6	3.141333
0.7	3.320622
0.8	3.65443
0.9	3.884076
1	4.081441
1.1	4.324705
1.2	4.595047
1.3	4.724685
1.4	5.082598
1.5	5.320064
1.6	5.539025
1.7	5.614333
1.8	5.872199
1.9	6.105161
2	6.371388
2.1	6.722655
2.2	6.850838
2.3	7.178936
2.4	7.376787
2.5	7.522729

2.315025
1.779446

2.8 Linear Regression. Fitting data to a straight line is a common operation in curve fitting. For this exercise, put .1 in cell A1. Put =A1+.1 in cell A2 and drag down to give a sequence of x-values from .1 to 2.5. Now, in B1 put the formula =2.3*A1+1.7+rand()*.2 and drag this formula down to get 25 values adjacent to the x-values. This gives the line y=2.3x+1.7 with a bit of random 'noise'. The LINEST function computes the least-squares approximation line for data. The y-values are the first argument for the LINEST function and the x-values are the second argument. Both are entered as *lists,* where a colon separates the extreme values. The slope is the first index of the resulting array, and the y-intercept is the second. So, in D1, put the formula =INDEX(LINEST(B1:B25,A1:A25),1) to get the slope and in D2 put the formula =INDEX(LINEST(B1:B25,A1:A25),2) to get the intercept. Are these close to the values you expected? How do you explain the discrepancy?