

Excel tips for CHEM 105 lab

Entering numbers, functions, equations, and text

If you are having any problem with formatting (can't do calculations, or x-values are 1, 2, 3... instead of values you entered), select the cells in questions, go to Format/Cells, choose Number tab, and choose the format you want: Number (choose number of decimal places to show), Scientific, Text, Percent, etc.

Numbers

An equals sign before an entry ensures that Excel interprets the entry as a number.

Never use spaces within numbers.

Acceptable ways to enter numbers:

<u>Entry</u>	<u>Result</u>	
=23	23	
23	23	(<i>might</i> not be understood as a number if cell format is set to <i>Text</i>)
=5E-2	0.05	
5E-2	0.05	(<i>might</i> not be understood as a number if cell format is set to <i>Text</i>)
=5*10^-2	0.05	(<i>must</i> use equal sign)
=pi()	3.14159...	(<i>must</i> use equal sign)
=exp(1)	2.71828...	(<i>must</i> use equal sign)

Functions

All functions have a portion in parentheses, which can be a number, a function, or a reference to the value in another cell.

Functions must be preceded by an equals sign. Otherwise they will be interpreted as text.

Uppercase or lowercase may be used.

<u>Entry</u>	<u>Result</u>	
=exp(7)	7.389...	(e ⁷)
=power(5,2)	25	(5 to the power 2)
=ln(A1)	Natural log of the number in cell A1.	
=log(A1)	Base-10 log of the number in cell A1	
=sum(A1:A3)	Adds up all the numbers in the range* of cells, i.e. A1+A2+A3.	
=average(A1:A3)	Average of all the numbers in the range of cells, i.e. (A1+A2+A3)/3.	
=stdev(A1,A3,A5)	Standard deviation of the numbers in cells A1, A3, and A5.	
=round(2.543,2)	2.54	(2.543 rounded to 2 decimal places)
=abs(A1)	Absolute value of the number in cell A1.	

*Ranges of numbers can be entered in several ways:

- 1) Type A1:B3 (this means cells A1, B1, A2, B2, A3, and B3)
- 2) Type your function, for example and open parenthesis "log(", then select the range with a mouse and press enter or type ")".
- 3) List individual values, i.e. (A1,B3,G6)

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Equations

Equations can contain numbers, functions, or references to values in other cells.

Excel uses standard algebraic order of operations.

<u>Entry</u>	<u>Result</u>
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=1*4+9	13
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=abs(8/35-9)	8.7714 (Excel will keep all digits in memory for future calculations, but you can set the number of digits to display. See “Significant figures” below.)
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=A1+3	Three plus the number in cell A1.
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=(A1+3)/G\$2	Three plus the number in cell A1, all divided by the number in cell G2.
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Text

A single quote before an entry ensures that Excel interprets the entry as text.

Acceptable ways to enter text:

<u>Entry</u>	<u>Result</u>
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Time	Time
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1+i	1+i
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4+A1	4+A1
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'10/10	10/10 (if you do not use the single quote, Excel may interpret it as a date)
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'5E-2	5E-2
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'= 7	= 7
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Copying

You can use the standard commands: Edit/Copy, Edit/Paste, Ctrl-C, Ctrl-V (command-C and command-V on Mac)

Copy an entry to neighboring cells: drag square in lower right corner to cover entire range you want to copy to. Your cursor will look like a “+” sign if you are dragging correctly. If you have an equation in the cell you are copying, see “Copying references” below.

Copying a pattern: If you have “1” in one cell and “2” in the cell below it, select both cells and drag square in lower right corner downward. Pattern will continue, with 3, 4, 5 ...

Copying references

A cell is said to “reference” another cell if it contains uses the value of another cell

A dollar sign in front of a letter or number in a reference ensures that that letter or number does not change when copied.

=A1	If you are in cell B1, cell A1 is immediately to your left. If you type “=A1” in cell B1, B1 will always contain the same number that is in cell A1, even if the number in A1 changes. If you select cell B1, copy it, and paste it into another cell, the new cell will automatically reference the number that is in the cell to left of the new cell. i.e. If you copy B1 to B2, it is the equivalent of typing “=A2” into cell B2.
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=\$A1	If you copy a cell with this reference, the copy will always reference column A ; the row number will change if you copy to a different row.
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=A\$1	If you copy a cell with this reference, the copy will always reference row 1 ; the column number will change if you copy to a different column.
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=\$A\$1	If you copy a cell containing this reference, it will always reference cell A1 .
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Graphs – Excel 2007

Put x-points in a column to the left of your y-points.

Use mouse to select all x-points and y-points that you want to plot.

Click on Insert tab, select Scatter, then choose the graph with no lines between points.

Click on Design tab and select Layout 1. Alternatively, if you select a graph that you have created, a “Chart Tools” tab group should appear. Within “Chart Tools” menu, you can click on the Layout tab to add chart and axis titles.

Adding a linear fit (“Trendline”):

Make an XY scatter plot with no lines connecting the points.

Right-click on a data point on the graph and click “Add Trendline”. Choose “Linear”.

Select “Display equation on chart” and “Display R-squared value on chart on Chart” Click OK.

Graphs – Excel 2003

Put x-points in a column to the left of your y-points.

Use mouse to select all x-points and y-points that you want to plot.

Click on bar-graph icon.

Select **XY(scatter)**. Never select Line.

Select chart sub-type.

Select Finish. (Or select Next, then Next, then enter graph and axis titles, *then* Finish.)

To enter graph and axis titles, right-click on plot area and select Chart Options.

Adding a linear fit (“Trendline”):

Make an XY scatter plot with no lines connecting the points. Right-click (ctrl-click on Mac) on one of the points in the data set that you want to fit with a line, and select "Add Trendline". On the “Type” tab, select “Linear”. On the “Options” tab, select “Display equation on chart” and “Display R-squared value on chart.” Click OK. To delete the legend that appears, just click on it and press delete.

Always check to make sure your plot looks reasonable.

Make sure axis numbers look approximately right.

Make sure points look reasonable (i.e. are your values supposed to increase or decrease?).

If x-values are 1, 2, 3... instead of what you entered, then Excel thinks that your x-values are text, not numbers. 1) Try entering equals signs in front of your numbers. 2) See “Entering numbers” above, and make sure your numbers are entered in a valid manner (Excel will not understand “4 x 10⁻⁴”). 3) If necessary, check Format/Cells (see “Entering numbers” above).

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Significant figures

When performing calculations with significant figures, you need to keep all the digits in your calculator until the very end of the calculations, then go back and report intermediate values with the correct number of significant figures. Excel is great for significant figures because it keeps all digits in memory for future calculations, but you can set the number of digits to display for each cell.

This is how you set the number of digits shown in Excel:

- 1) Select the cells you want to change
- 2) Right-click (ctrl-click) on the selected cells and choose "Format Cells"
- 3) If you want to set the number of significant figures:
 - On the "Number" tab, select "Scientific" as the category, then set the decimal places to one less than the number of significant figures you want displayed.

If you want to set the number of decimal places:

- On the "Number" tab, select "Number" as the category, and then set the number of decimal places you want.

This is how to get icons in your toolbar at the top that will make this task easier:

- 1) Right-click (ctrl-click) somewhere in your toolbar at the top (somewhere where there is not an icon).
- 2) Select "Customize"
- 3) On the "Command" tab, set to choose commands from "All Commands".
- 4) Search through the list of icons in the "Commands" list on the right, until you find "Increase Decimal" and "Decrease Decimal". Drag the icons next to these words into your toolbar.
- 5) Click "Close"
- 6) You can use the icons to increase or decrease the number of decimal points showing in a cell (cells) that you have selected.