



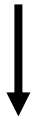
# Microsoft Excel 2007 Tutorial

CIS\*1000\*DE



# Open Microsoft Excel 2007

**START**



**PROGRAMS**



**Microsoft Office 2007**



**Microsoft Excel 2007**


**OR**

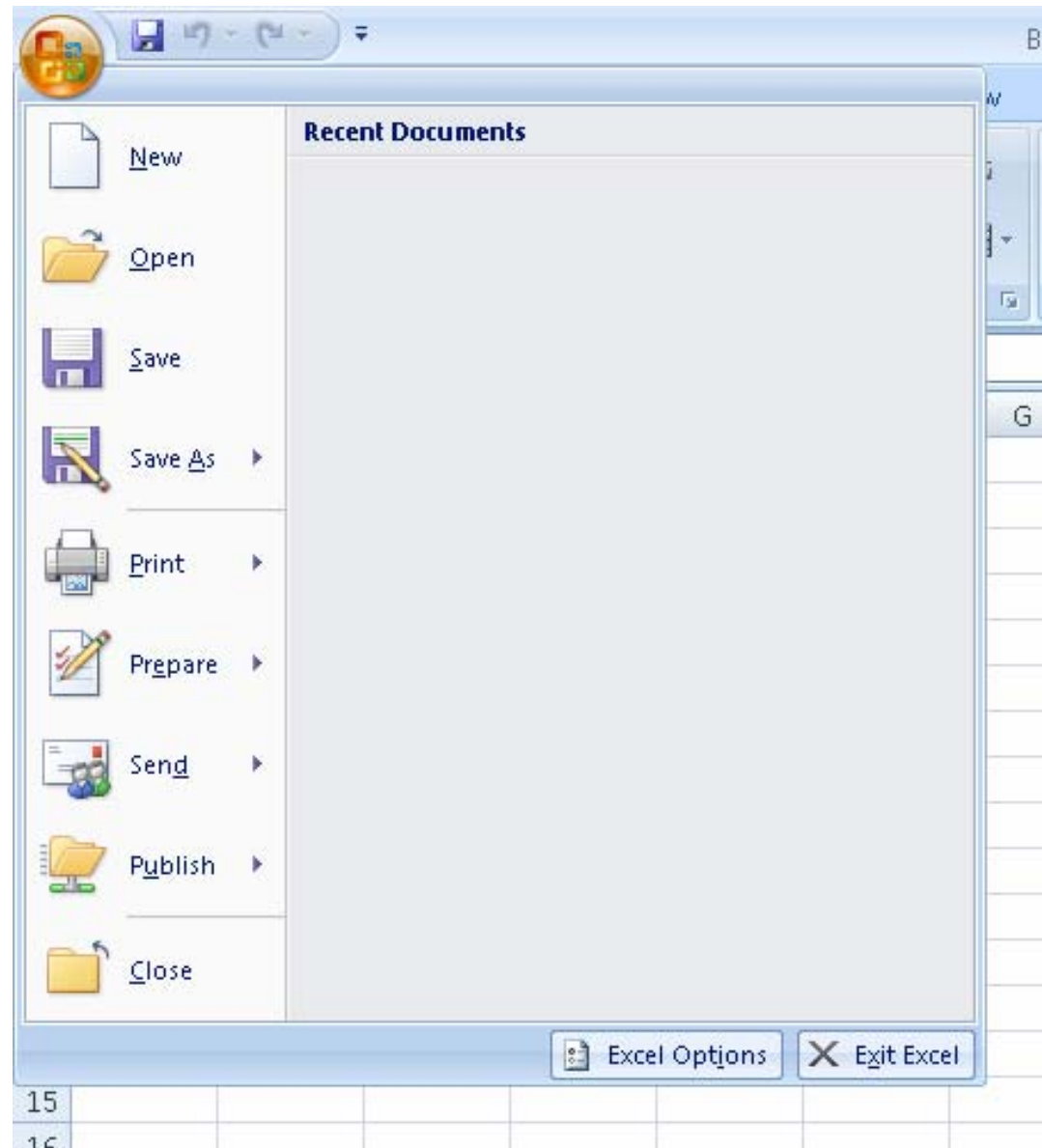
**Double click on  
the ICON on  
desktop**



Saving your

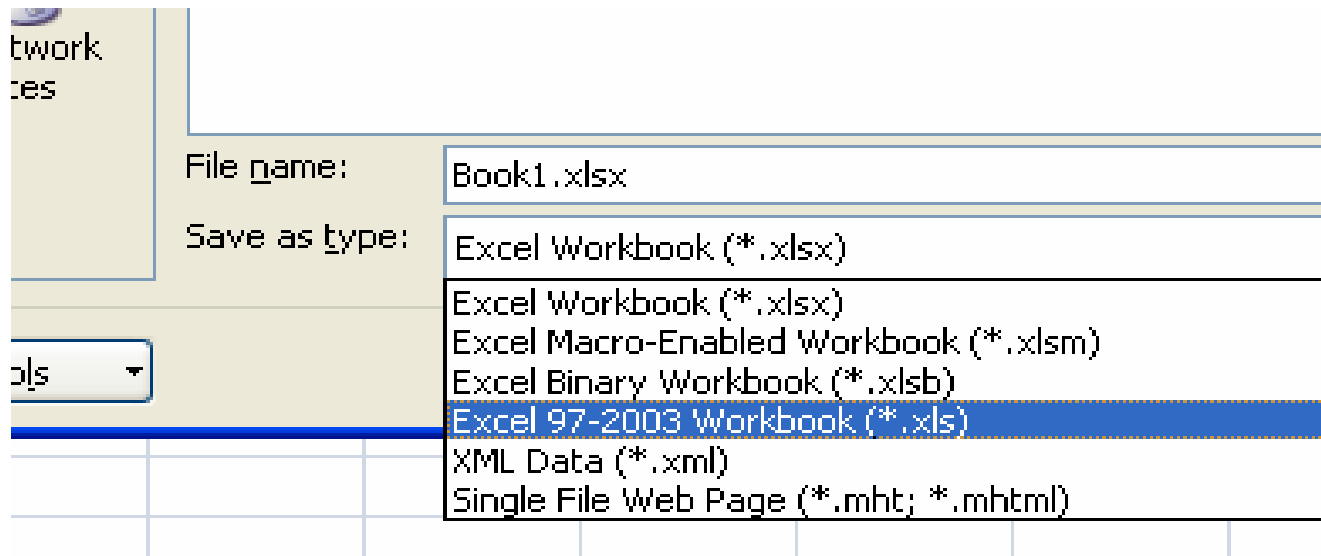
# Workbook

- To save your document, simply click on the MS 2007 logo in the top left-hand corner [  ] and the menu bar that you see on your right here will drop down giving you various options, including saving.




# Saving your Workbook *cont'd*

- When you save a workbook in MS Excel 2007, it automatically saves with “.xlsx” as its extension.
- However, you can also save your workbook so that it's readable by earlier versions of MS Excel (97 – 2003) by simply selecting “Excel 97-2003 workbook (\*.xls)” when choosing what file type to save as (please see the screenshot below)



# Getting Help in MS Excel 2007

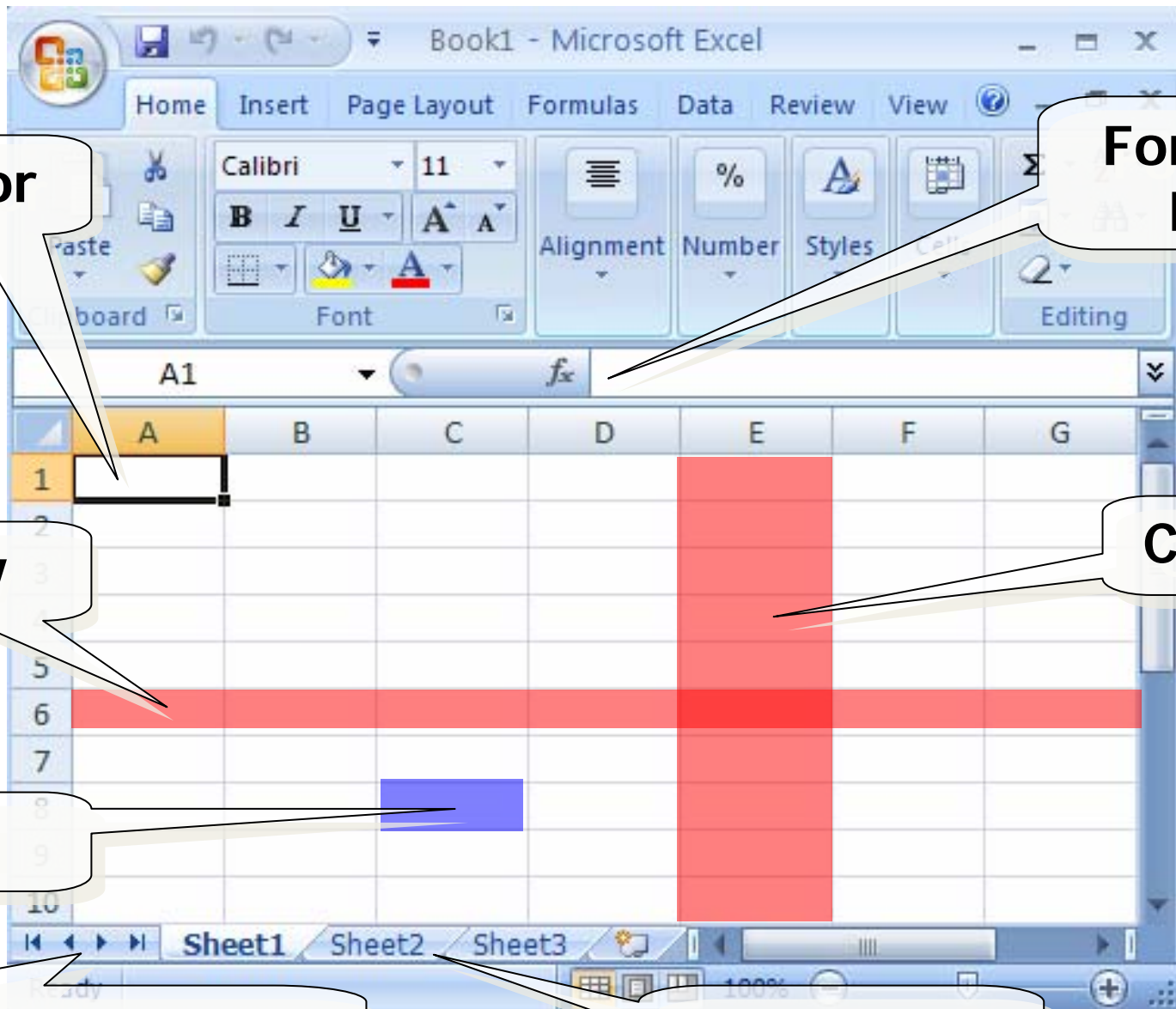


- To get help in Excel 2007, look for the help icon [  ] in the top right-hand corner of the screen and click on it.
- You will be presented with a window that looks like the one here on the right.



# Some Terminology

- **Workbook** – An Excel file containing several worksheets
- **Worksheet** – Rectangular grid of rows & columns that labels and values are inserted into
- **Cell** - The intersection of a row and column, identified by an address (ex. A1, F4, Z55)
- **Value** – Numerical data in a cell
- **Label** – Non-numerical data in a cell
- **Table** – A logically distinct group of cells, visually distinguished with borders and shading



**Cursor**

**Formula  
Bar**

**Row**

**Column**

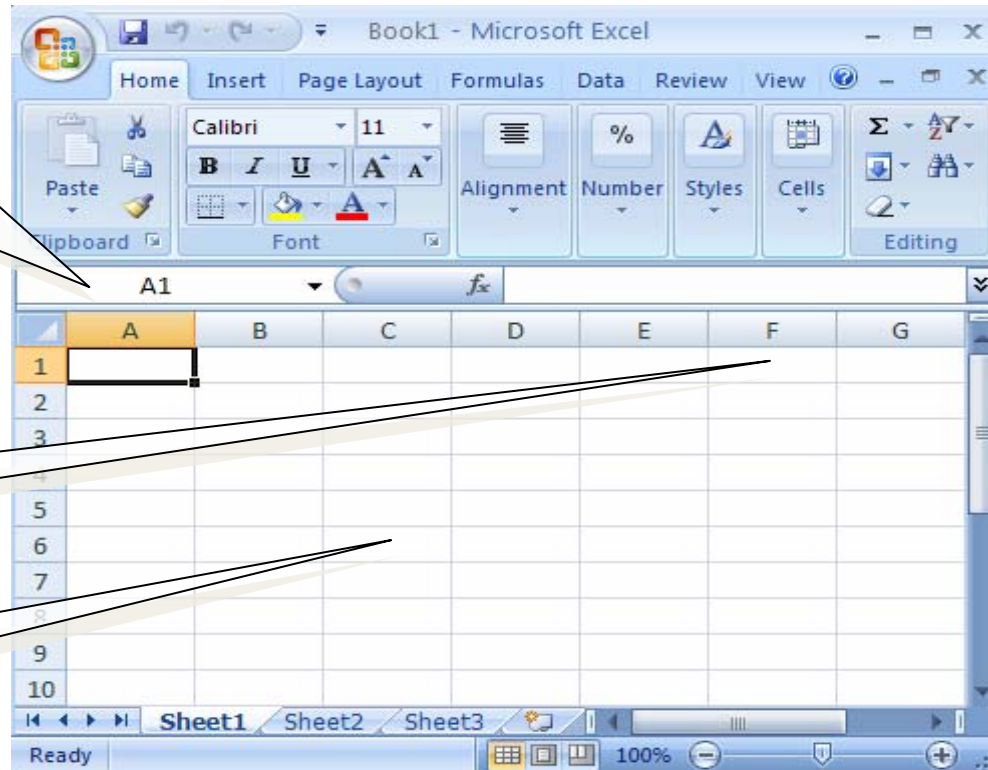
**Cell**

**Tab Navigation**

**Sheet Tabs**

# Cell Referencing

Address of  
the cell  
containing  
the cursor



F1

C6

- **Column(Letter) then Row(Number)**  
*Kinda' Like Battleship (the board game)*





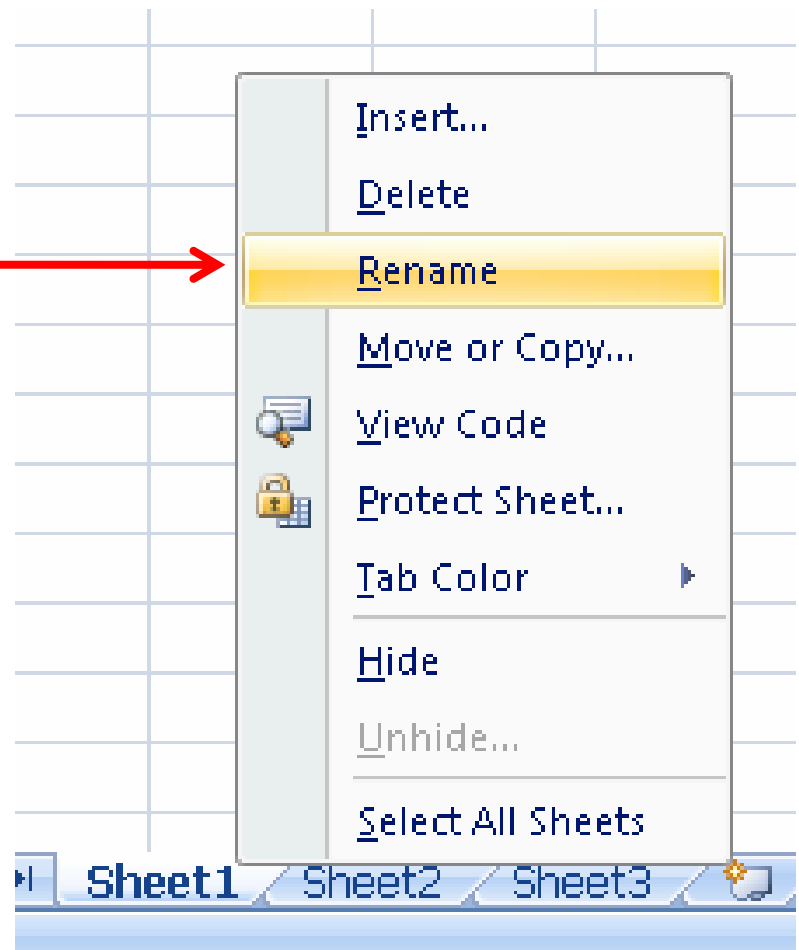
# Navigation Shortcuts

**In addition to the intuitive mouse and arrow-key movement between cells, these shortcuts can make lots of data easier to input:**

- **Home:** Move to beginning of row
- **Ctrl+Home:** Move to “A1”
- **Enter:** Move one cell down
- **TAB:** Move one cell to the right
- **Shift+TAB:** Move one cell to the left
- **End+→:** Move to last used cell in row
- **End+↓:** Move to last used cell in column
- **F2:** Edit the the content of a cell


# Renaming Worksheets

- **Right-click** on the tab for the sheet you need to rename and choose **rename**
- Notice the other options that are available
  - We can also insert, delete, copy, and select all sheets
- Rename the sheet to “My First Spreadsheet”

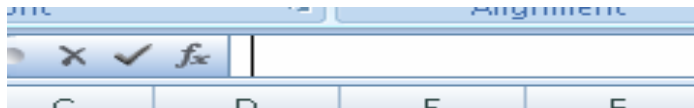



# Entering Data

- To enter simple data into a cell we can either:

- Position the cursor on the cell  and then type on the keyboard and press Enter

**OR**

- Position the cursor on a cell and then click on the formula bar,  type the data, press Enter or click on the  to cancel.



# Inserting New Rows and Columns


- Click on the row or column header
- Right click and choose insert
- Rows are inserted **above** the selected row
- Columns are inserted to the **left** of the selected column
  - *Note: Affected merged cells will automatically grow*

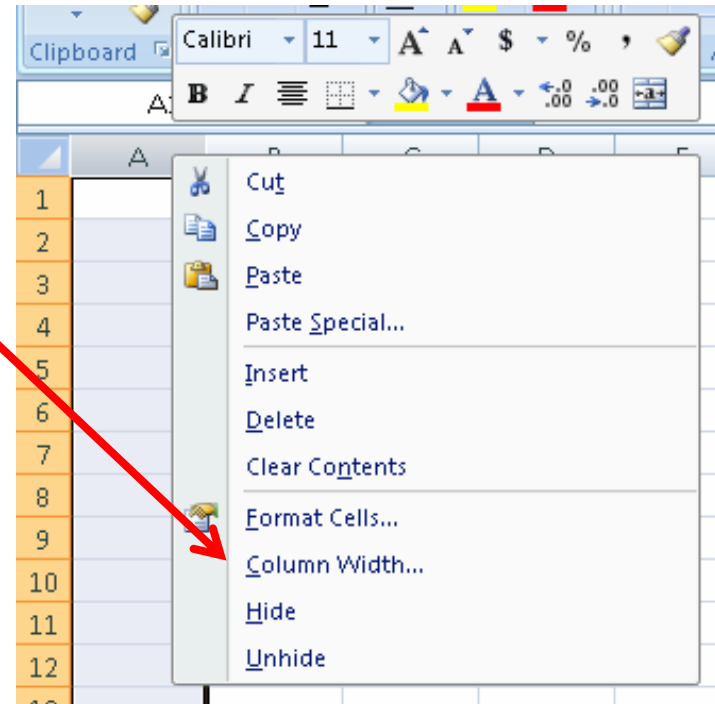
# Deleting Rows and Columns

## *An Example...*

- Type a number into any cell in row “8”
- **Right-click** on a row header “8” & select **Delete**
- Type a number into any cell in column “B”
- **Right-click** on the column letter “B”, & select **Delete**
  - The row/column is removed, along with any formulas, data and formatting.
  - The adjacent cells are shifted up/left and the row or column is re-labeled to reflect the new change

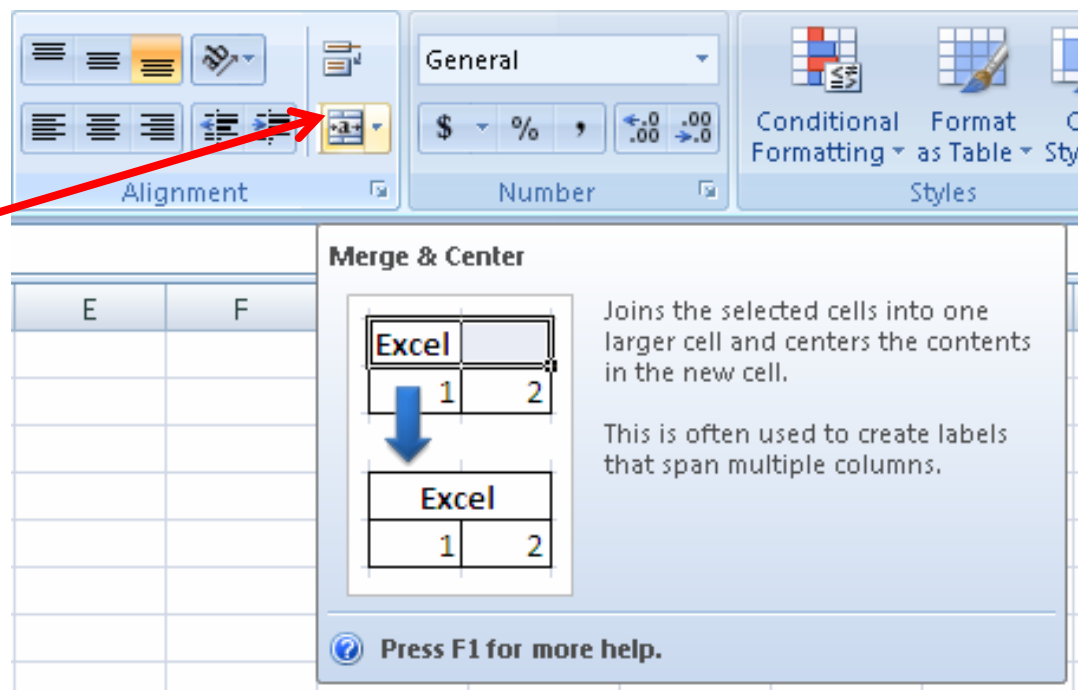
# Column Width

- Make the first column, A, wide enough to accommodate the width of the text labels.
- Right-click on the column letter  and you'll be given the following options:
- Select “Column Width”
- *Shortcut, you can also click on the line the column letters and drag cursor left or right.*

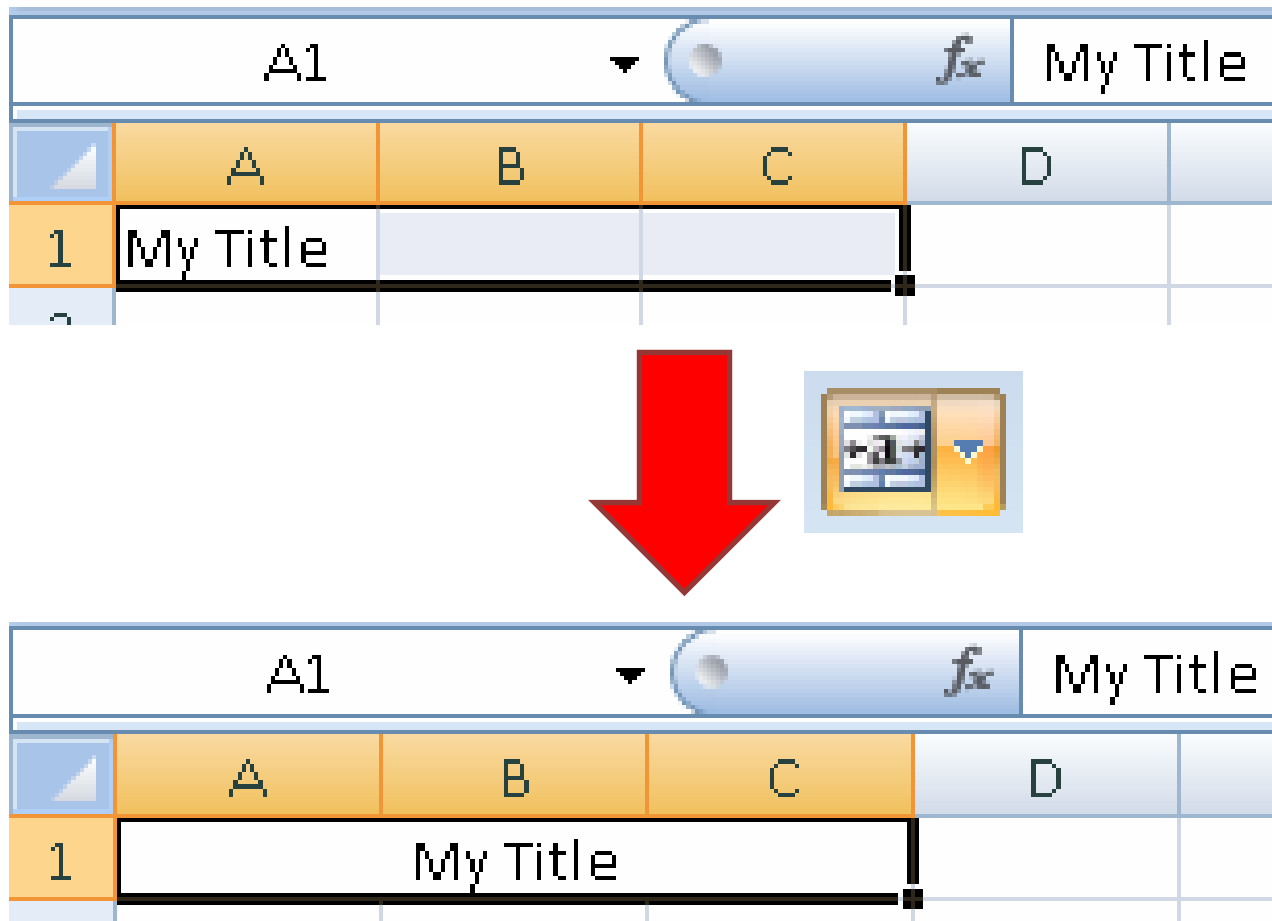


# Merging Cells

- Merging allows one cell to take up multiple rows and/or columns
- To merge 2 or more cells, highlight the desired cells to merge and click on the merge & center button:







# Merging Cells *cont'd*





# Currency Style

- We can change the format of numerical data to appear as currency.
- Highlight some **columns** which contain numbers
- Click the **Currency button**  on the Home tab
  - ✓ Note: there are also buttons for Percentage Style  , and Comma Style 
- Click on the Decrease Decimal button  twice to remove decimal places

\$ 1.00	\$ 1
\$ 2.00	\$ 2
\$ 3.00	\$ 3
\$ 4.00	\$ 4
\$ 5.00	\$ 5

# A Quick Note About Percent Style

$$0.01 = 1\%$$

$$0.1 = 10\%$$

$$1 = 100 \%$$

$$10 = 1000 \%$$

$$100 = 10000\%$$

$$\frac{1}{4} = 0.25 = 25\%$$

$$\frac{1}{2} = 0.50 = 50\%$$

$$\frac{3}{4} = 0.75 = 75\%$$

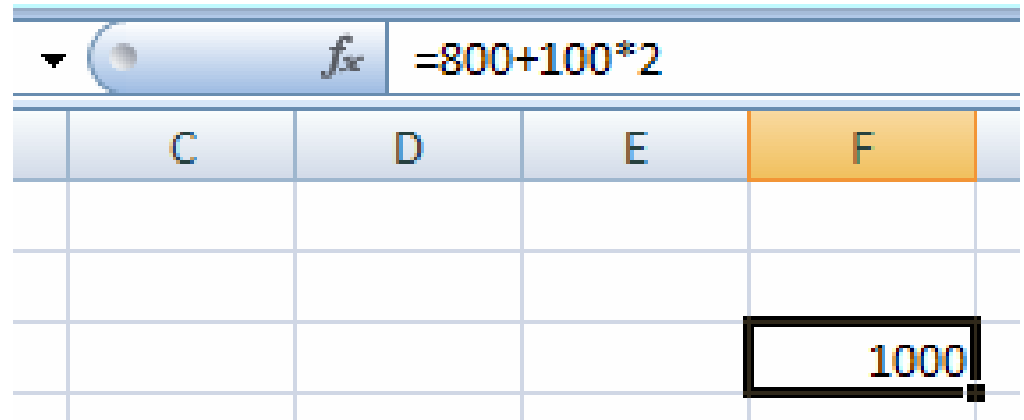
etc...

# Using Formulas

- A formula is a special entry in a cell, that calculates its value based on other cells, and/or constants
- By beginning an entry into a cell with an “=” we let Excel know we’re using a formula
- Without the equal sign “=” Microsoft Excel assumes you’ve entered a label or value

# A Simple Formula

- Select any cell on your spreadsheet and type:  
**=800+100\*2**
- Press **<Enter>**
- Excel recognizes the '=' sign and calculates the result
- Note that the formula is shown in the formula bar (while that cell is selected) and that the computed value is displayed in the cell
- Also note that Excel respects the order of operations (BEDMAS)



# Linking Cells

- You can refer to cells in a formula by simply using the cell's reference name.
- Enter some data or a label into cell A1
- Select cell **A2** and type: **=A1**
- Now, when the information in A1 is changed, those changes will automatically show up in cell A2
- You can even link cells from different worksheets!
- For example, in **Sheet2** select cell **A1** and type:

**=My First Spreadsheet!A1**

=sheet name!cell address



**\*Note the Exclamation Mark!!!**

# Using Cell References In Formulas

- In Cell **A2** type: **=A1\*2**
- Now, change the value in A1
- Excel will automatically update the value shown in cell A2
- So, this is just like a link
  - the value in A1 is substituted in before Excel performs the calculations in cell A2
- This works with cells linked in between different worksheets too! 😊

# Built-In Functions

- Excel comes with hundreds of built-in functions which can be used in your formulas.
- However, the majority of functions need data in order to be useful
  - For example, in order to use the Sum function, you need to tell Excel which values to sum up.
- These built-in functions can operate by themselves, on a single value, or on multiple values depending on what kind of operation is being performed
  - For example, the Pi function simply returns the value of Pi, the Square Root function needs only one number to work while the Z-Test function (from stats) requires three different numbers in order to work.

# Built-In Functions *cont'd*

- Built-In Functions are **structured** like this:

**FunctionName** (**Parameter1,...**)

- The FunctionName always comes first and usually describes what the function does.
- The Parameter is the information that the function needs in order to work
- This can be a single value or a set of values and can be represented by either numbers (ex. 1, 2, 3, 5, 8, 13, etc...), cell references (ex. A1, B2, C3:D4, etc...) or text.
- The Parameter(s) always comes second and are always contained within parentheses “ ( ) ”.



# Built-In Functions *cont'd*

- SUM( ) Adds all numbers in a range of cells
- PRODUCT( ) Multiplies all the numbers in a range of cells
- COUNT( ) Counts all the cells that contain numbers in a range of cells
- AVERAGE( ) Calculates the average in a range of cells
- MEDIAN( ) Calculates the median in a range of cells
- MODE( ) Calculates the mode in a range of cells
- POWER( ) Calculates a number raised to a power
- SQRT( ) Calculates the square root of a number
- MAX( ) Returns the largest number in a range of cells
- MIN( ) Returns the smallest number in a range of cells

# Built-In Functions *cont'd*

- IF( ) Checks whether a condition is met, and returns one value if true, and a different value if false
- COUNTIF( ) Count the number of cells within a given range that meet the given condition
- PI( ) Returns the value of Pi, accurate to 15 digits
- MOD( ) Returns the remainder when a number is divided by
- LEN( ) Returns the number of characters in some text
- ROMAN( ) Converts an Arabic numeral to Roman, as text
- CONCATENATE( ) Joins several pieces of text to each other
- TODAY( ) Returns the current date
- NOW( ) Returns the current date and time

# Built-In Functions *cont'd*

- There are two different ways to use functions:
  1. The first way is to simply write them out
    - ✓ This will save you time if you know what functions you'll be using and how to use them
  2. The second way is to use the wizard
    - ✓ This is a great way to learn about the many different kinds of functions and operations that excel can perform **and how to use them.**

# Built-In Functions *cont'd*

=SUM(A1,A5,A10,A15,A20)

- This formula uses **commas** and will sum up the values for the five cells A1, A5, A10, A15, A20

=SUM(A1:A20)

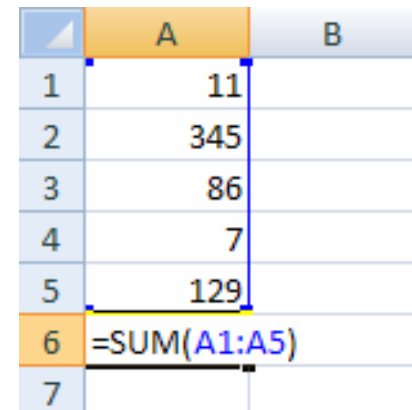
- This formula uses a **colon** and will sum up the values for the range of cells A1 to A20.

**Make sure you understand the difference between these two examples!**

# Built-In Functions *cont'd*

- Let's do an example!
- Type numbers into the first 5 rows of column **A**
- In cell **A6** type: **=SUM(A1:A5)**
- A6 now contains the sum of A1 to A5
- To find the average you would use:

**=AVERAGE(A1:A5)**



A screenshot of an Excel spreadsheet with two columns, A and B, and seven rows. Column A contains the values 11, 345, 86, 7, and 129 in rows 1 through 5. Row 6 is highlighted, and cell A6 contains the formula =SUM(A1:A5). The result of the formula, 370, is displayed in cell A6. The formula bar at the bottom shows the formula =SUM(A1:A5).

	A	B
1	11	
2	345	
3	86	
4	7	
5	129	
6	=SUM(A1:A5)	
7		

- How could you find the difference between the biggest number and the smallest number in a range of cells?

**=MAX(A1:A5) – MIN(A1:A5)**

# Built-In Functions *cont'd*

- Some functions in Excel accept a condition as a parameter.

This is the range of cells to search ————— this is the condition

**=countif(A1:A100, ">75")**

- This function will tell us how many cells in the range of A1 to A100 contain a value that is greater than 75.
- We could have also used <, =, <=, >= in our condition**

This is the condition

If TRUE, return this value

If FALSE, return this value

**=if(A2 > A3, "A2 is bigger", "A3 is bigger")**

# Built-In Functions *cont'd*

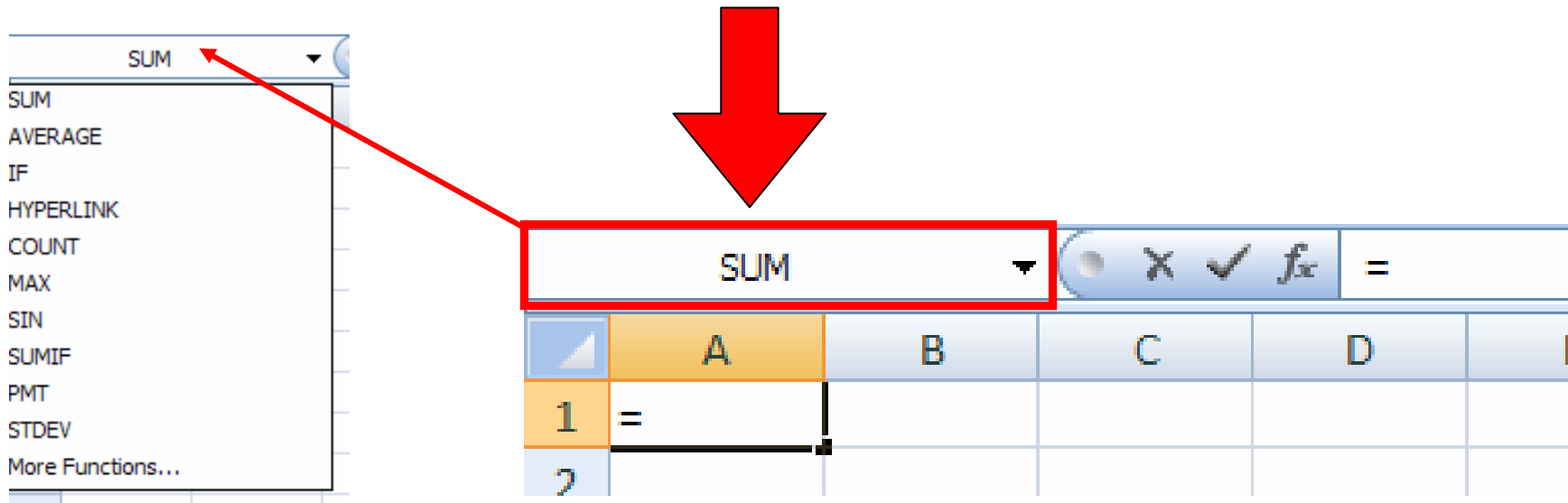
## *Getting Fancy*

**=if(countif(A1:A20, ">75") > 10, "More than half over 75", "At least half under 75")**

- So, what does this thing do?
- Notice how there are 2 different built-in functions.
- The best way to work through this is to start with the inside built-in function, in this case, countif( ), and work our way out.
- The inside function will count the number of cells from A1 to A20 that contain values greater than 75.
- The outside function will check to see if that "counted" number of cells is greater than 10, and if it is, then it'll return "More than half over 75", otherwise, it'll return "At least half under 75"

# Using the Wizard for Built-In Functions

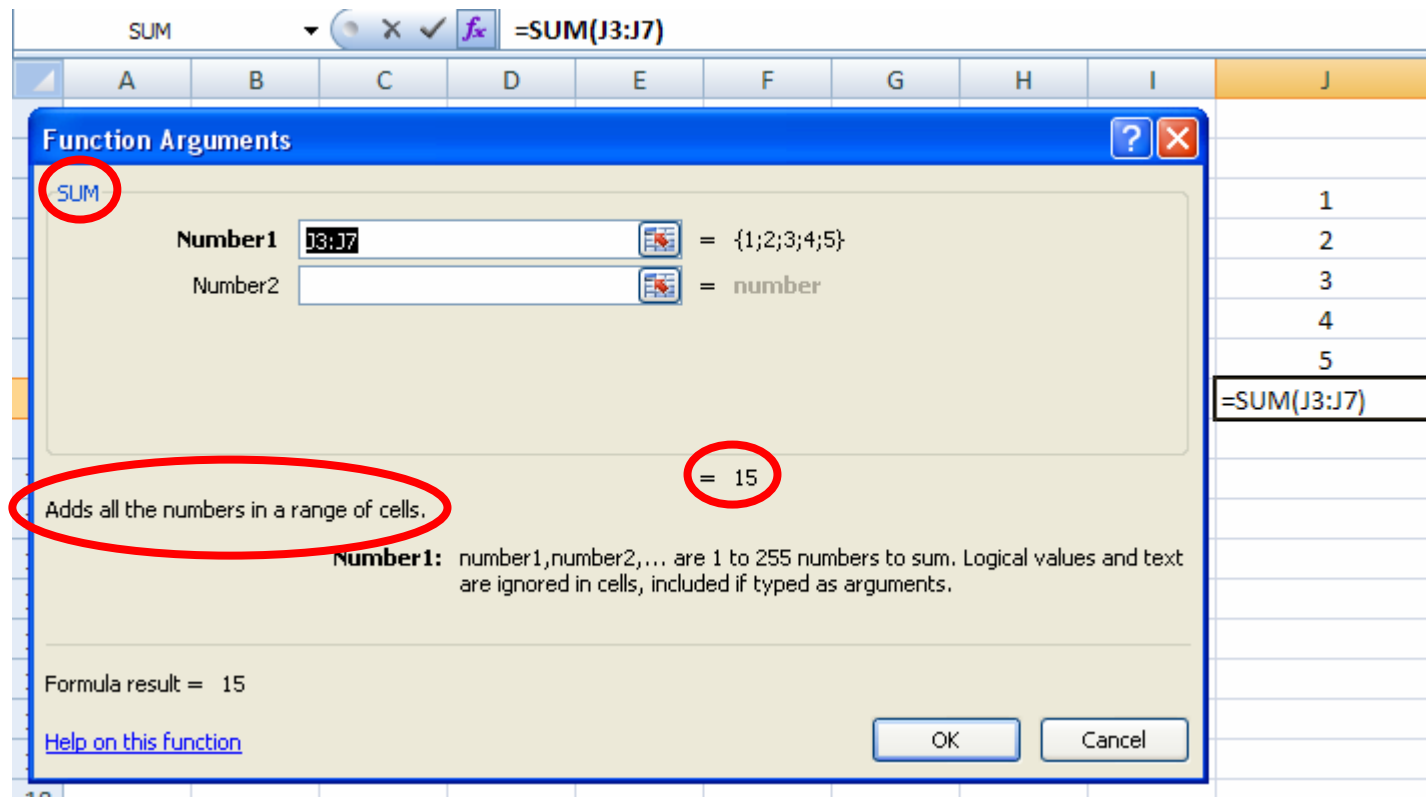
- Select any cell on the spreadsheet
- Click the “=” or the “ $f_x$ ” button on the **Formula bar**
- The drop-down-box to the left of the “=” can be used to select a function.



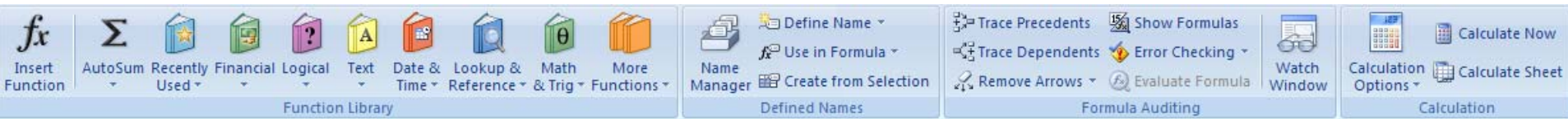


# Using the Wizard for Built-In Functions *cont'd*

- A help wizard will then guide you through the entry of your formula



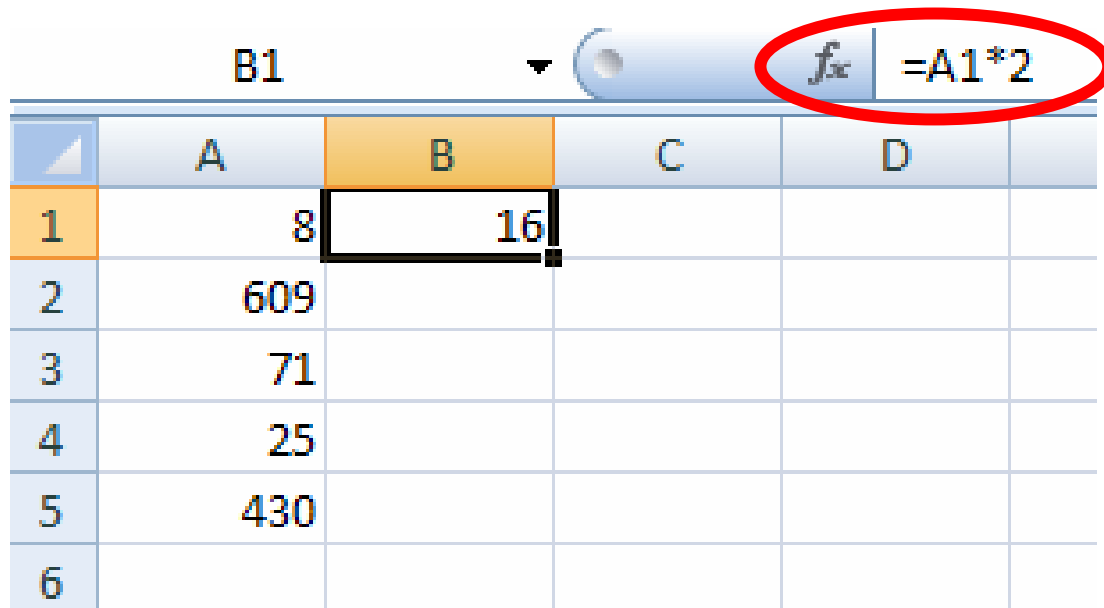
# The Formulas Tab



- New to MS Excel 2007 is a tab with many of Excel's built in functions / formulas neatly organized into different categories
- While some people may prefer to simply type in their desired formula, others may want to explore what Excel has to offer by searching through and experimenting with the options presented in this tab.

# Advanced Cell Referencing

- When we copy/cut & paste a formula Excel transforms it, treating all references as **Relative**.
- For example, type random numbers into the first 5 rows of column A again, and enter the formula:  
**=A1\*2** into cell **B1**



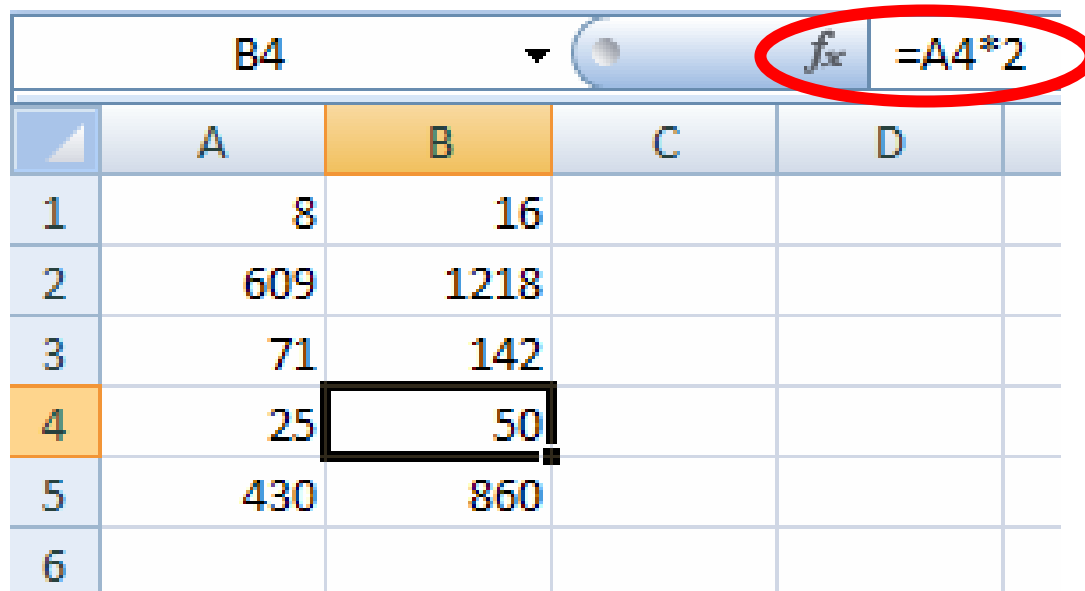
The image shows an Excel spreadsheet with the following data:

	A	B	C	D
1	8	16		
2	609			
3	71			
4	25			
5	430			
6				

The formula bar at the top shows the formula **=A1\*2** entered in cell B1, which is circled in red. The cell B1 is also highlighted with a black border.

# Advanced Cell Referencing *cont'd*

- Now, copy and paste the formula into cells B2, B3, B4, & B5
- Notice how the formula has changed...
- ...we moved down 3 rows and so too has the cell reference (it changed from A1 to A4)



	B4			
	A	B	C	D
1	8	16		
2	609	1218		
3	71	142		
4	25	50		
5	430	860		
6				

# Advanced Cell Referencing *cont'd*

- We can also tell Excel not to transform a reference (making it an **Absolute Reference**)
- Let's do another example
  - In **A1** write: **"Tax Rate"**
  - And in **B1**, write: **"1.15"**
- Next, create a list of items (*ex. things that you'd like to sell*) in column A and list their prices in their adjacent cells in column B

# Advanced Cell Referencing *cont'd*

- To get the price of the mattress **After Tax**, we use the formula:

**=B\$1\*B4**

Absolute  
Reference

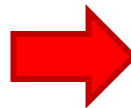
Relative  
Reference

$$(1.15) * (\$50.00) = \$57.50$$

	A	B	C	D	E
1	Tax Rate	1.15			
2					
3	Item	Price	After Tax		
4	Mattress	\$ 50.00	=B\$1*B4		
5	Kettle	\$ 10.00			
6	Desk	\$ 65.00			
7	Lamp	\$ 5.00			
8	Couch	\$ 35.00			
9					

# Advanced Cell Referencing *cont'd*

	A	B	C
1	Tax Rate	1.15	
2			
3	Item	Price	After Tax
4	Mattress	\$ 50.00	\$ 57.50
5	Kettle	\$ 10.00	
6	Desk	\$ 65.00	
7	Lamp	\$ 5.00	
8	Couch	\$ 35.00	



	A	B	C
1	Tax Rate	1.15	
2			
3	Item	Price	After Tax
4	Mattress	\$ 50.00	\$ 57.50
5	Kettle	\$ 10.00	\$ 11.50
6	Desk	\$ 65.00	\$ 74.75
7	Lamp	\$ 5.00	\$ 5.75
8	Couch	\$ 35.00	\$ 40.25

- Now, copy and paste the formula into the remaining cells

# Advanced Cell Referencing *cont'd*

- We do this because we want the formula (or rather Excel) to “remember” the location of the tax rate. That way the tax rate is applied to the prices of all the items.
- If we didn't add the absolute reference (\$B\$1), and instead used the relative reference (B1), then we would have ended up with the formulas: C5=B2\*B5, C6=B3\*B6, C7=B4\*B7, C8= B5\*B8 and that would produced the following:

	A	B	C
1	Tax Rate	1.15	
2			
3	Item	Price	After Tax
4	Mattress	\$ 50.00	\$ 57.50
5	Kettle	\$ 10.00	\$ -
6	Desk	\$ 65.00	#VALUE!
7	Lamp	\$ 5.00	\$ 250.00
8	Couch	\$ 35.00	\$ 350.00

*obviously wrong!* ☹️

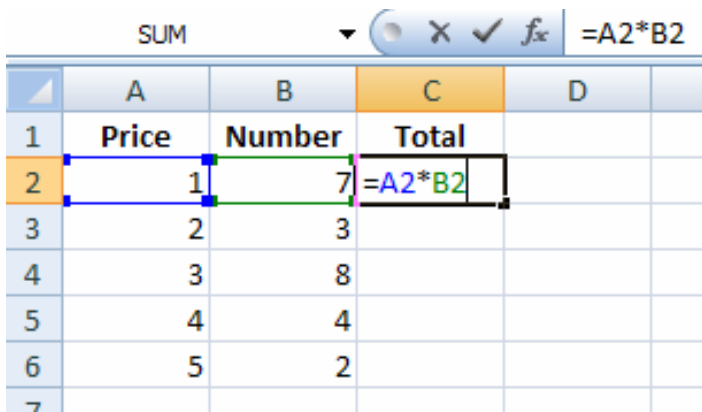


# Referencing Review

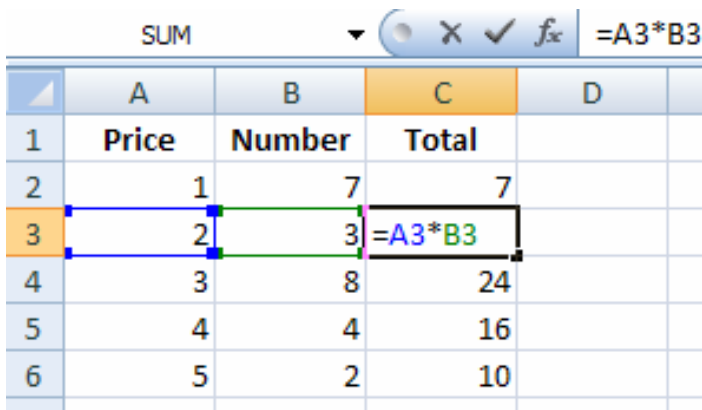
- Cells are identified by their:  
**Column** (a letter) & **Row** (a number)
  - Ex. **A1**, **F3**
- Ranges of cells can be referenced using a colon “:”
  - Ex. A1:B10
- References to other worksheets take the form:  
**=‘sheet name’!cell name**
  - *For example, ‘My First Spreadsheet’!A1:B10*

# Relative Referencing Review

- Most references are relative.
- For example, when the formula  $A2*B2$  is copied & pasted into cells C3, C4, C5, and C6, Excel automatically assumes that you wish to apply the formula to row 3 by using A3 & B3 instead of A2 & B2



	A	B	C	D
1	Price	Number	Total	
2	1	7	=A2*B2	
3	2	3		
4	3	8		
5	4	4		
6	5	2		
7				



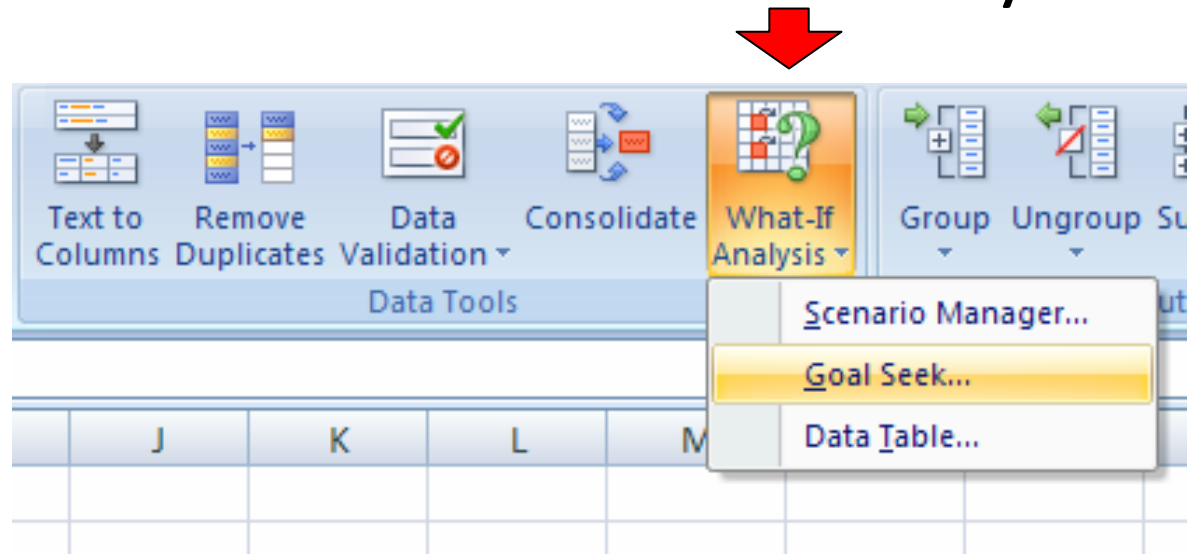
	A	B	C	D
1	Price	Number	Total	
2	1	7	7	
3	2	3	=A3*B3	
4	3	8	24	
5	4	4	16	
6	5	2	10	
7				

# Absolute Referencing Review

- When you don't want a part of your formula transformed you can protect it by adding: '\$'
- Columns and rows can be isolated separately or together, for example:
  - \$A1 – the column part (A) is locked
  - A\$1 – the row part (1) is locked
  - \$A\$1 – both the row and column are locked

# Goal Seek

- Goal seek is a “what-if” analysis tool
- Essentially, goal seek changes the value of one cell used in a formula by changing the value of another cell in the formula.
- Goal seek can be found under “What-If Analysis” in the **Data** tab.



# Goal Seek (cont'd)



- With this example I am trying to determine how many apples \$5 will buy me.

D2		fx		1
1	A	B	C	D
2	Item	Price	Number	Total
2	Apple	\$ 0.50	2	1
3	Orange	\$ 0.75	3	2.25
4				
5				
6				
7				

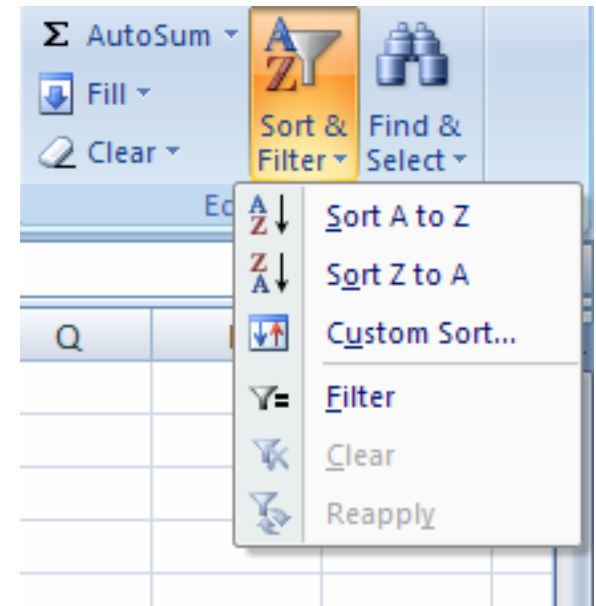
**Goal Seek**  
Set cell: \$D\$2  
To value: 5  
By changing cell: \$C\$2  
OK Cancel

# Sorting

- Sorting can be done from the **Home** tab by clicking on the “Sort & Filter” option. Choose from...

- Sort Descending / Sort A to Z 
- Sort Ascending / Sort Z to A 

- Sorting can also be done from the **Data** tab by using the sort buttons



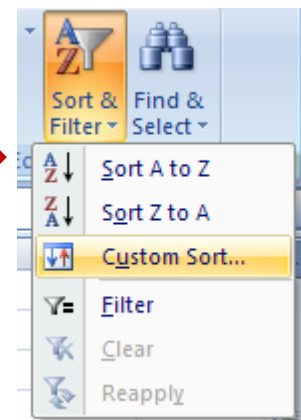
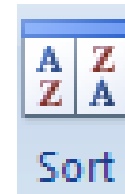
- To Sort, just highlight the specific cells that you'd like sorted and then choose to have them sorted in Ascending (Z to A) or Descending (A to Z) order.

# Sorting *cont'd*

- Let's do an example!
- Let's sort this table according to Sex, then according to Age, and lastly according to Name.

	A1			f <sub>x</sub>	Name
	A	B	C	D	
1	<b>Name</b>	<b>Sex</b>	<b>Age</b>		
2	John	M	24		
3	Greg	M	22		
4	Zoe	F	30		
5	Dave	M	35		
6	Cecil	F	23		
7	James	M	22		
8	Charles	M	21		
9	Pam	F	50		
10	Edna	F	40		
11	Anna	F	20		
12	Maddy	F	22		
13					

- Select the entire table and...
- Home tab → “Sort & Filter” → Custom Sort →
- Data tab → “Sort & Filter” → Sort →



# Sorting *cont'd*

The screenshot shows the Microsoft Excel interface with the 'Data' tab selected. A data table is visible in the background, and the 'Sort' dialog box is open in the foreground.

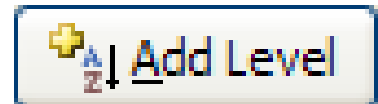
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	<b>Name</b>	<b>Sex</b>	<b>Age</b>										
2	John	M	24										
3	Greg	M	22										
4	Zoe	F	30										
5	Dave	M	35										
6	Cecil	F	23										
7	James	M	22										
8	Charles	M	21										
9	Pam	F	50										
10	Edna	F	40										
11	Anna	F	20										
12	Maddy	F	22										

The 'Sort' dialog box is open, showing the following settings:

- My data has headers:** ☒
- Sort by:** Sex (Values, A to Z)
- Then by:** Age (Values, Smallest to Largest)
- Then by:** Name (Values, A to Z)

Buttons: Add Level, Delete Level, Copy Level, Options..., OK, Cancel.

*Note! Use the "Add Level" Button to add more sorting levels*





# Sorting *cont'd*

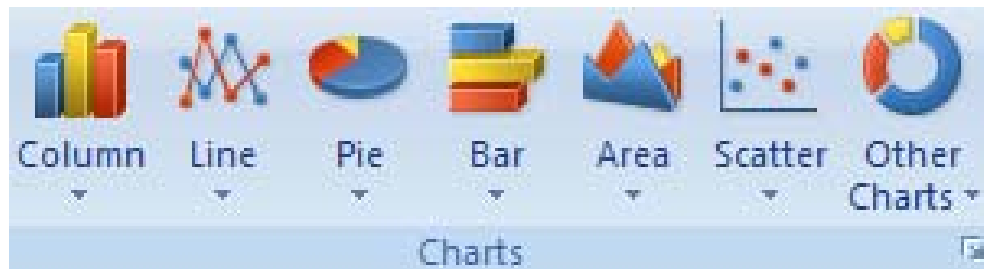
- As can clearly be seen here, this table has now been sorted on three different levels



	A	B	C
1	Name	Sex	Age
2	Anna	F	20
3	Maddy	F	22
4	Cecil	F	23
5	Zoe	F	30
6	Edna	F	40
7	Pam	F	50
8	Charles	M	21
9	Greg	M	22
10	James	M	22
11	John	M	24
12	Dave	M	35

# Using Charts

- Excel offers a variety of chart types.
- Column, Bar, Line, Pie, and Scatter being the most common choices.
- But before we can make a chart, we'll need data.



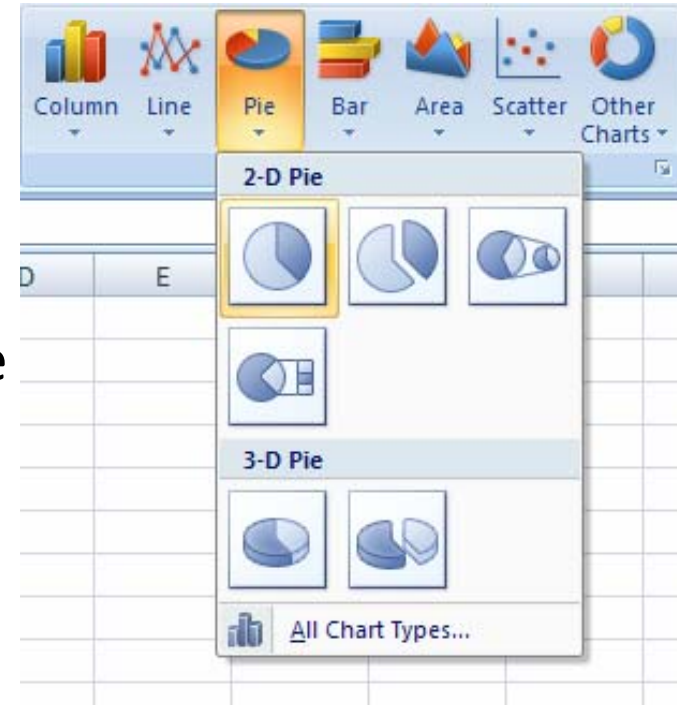
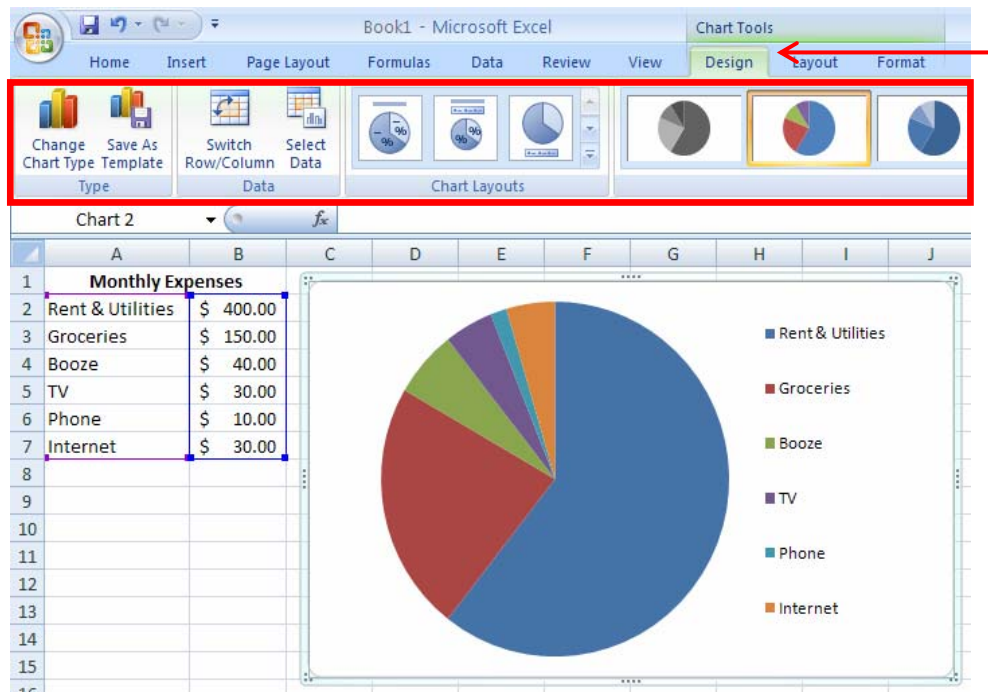
# Making A Pie Chart

- For an example we'll need some actual data to chart so generate a list of monthly expenses such as this one.

	A	B
1	<b>Monthly Expenses</b>	
2	Rent & Utilities	\$ 400.00
3	Groceries	\$ 150.00
4	Booze	\$ 40.00
5	TV	\$ 30.00
6	Phone	\$ 10.00
7	Internet	\$ 30.00

# Making A Pie Chart *cont'd*

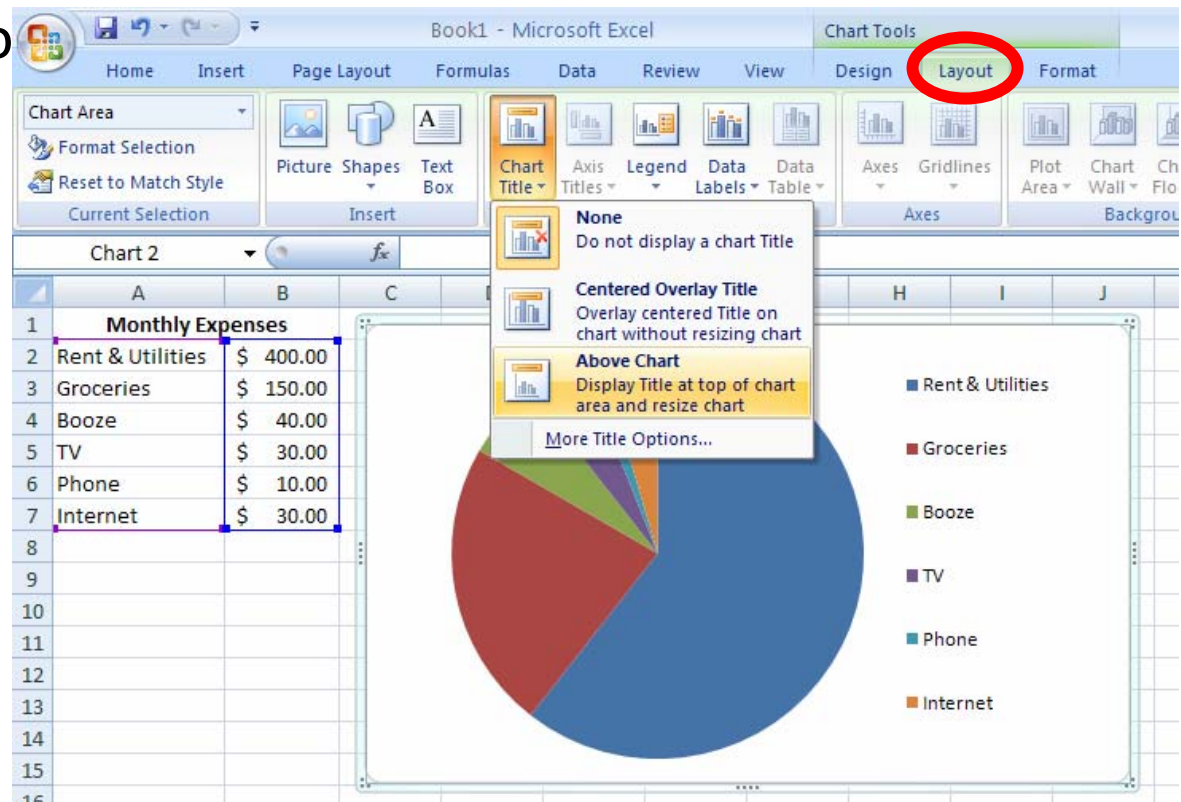
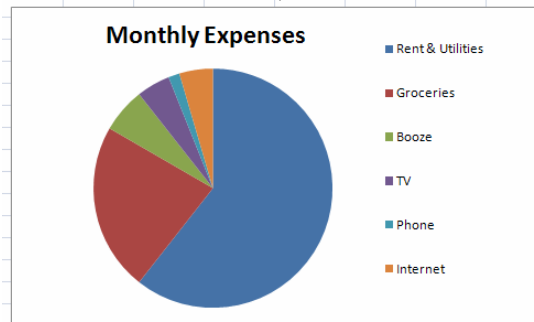
- Select the data that you wish to chart (*including the labels: TV, Phone, etc...*).
- From the **Insert** tab, click on “Pie” and select the appropriate type of pie chart
- You should get something that looks like this...



*Note that the **Design** tab is now present.*

# Making A Pie Chart *cont'd*

- To add a chart title, select the **Layout** tab and click on “Chart Title”
- Almost everything in the graph can be edited by simply right-clicking on the desired component and choosing the appropriate option.
- For this example we’ll choose the “Above Chart” option.



# Making An XY Scatter Plot


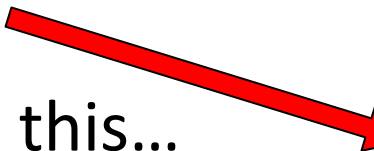
	A	B
1	X	Y
2	1	1
3	2	4
4	3	9
5	4	16
6	5	25
7	6	36
8	7	49
9	8	64
10	9	81
11	10	100
12	11	121
13	12	144

**=A2\*A2**

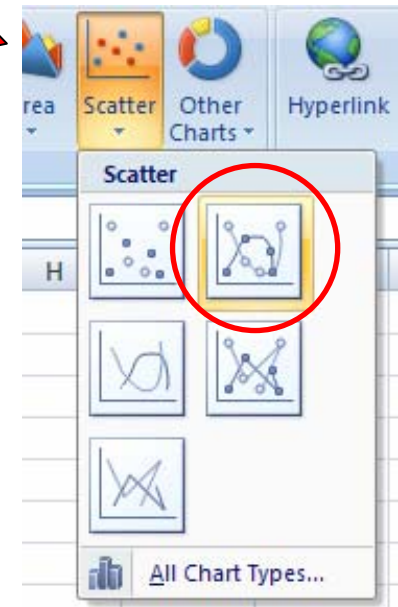
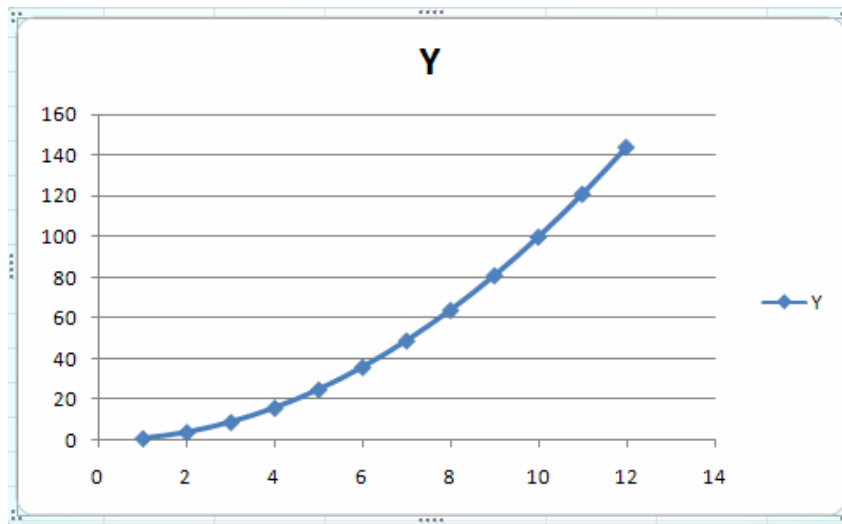
Create a table in which the values of the 'Y' column are equal to the square of the values in the adjacent 'X' column

This is called an "Exponential Series"

# Making An XY Scatter Plot *cont'd*

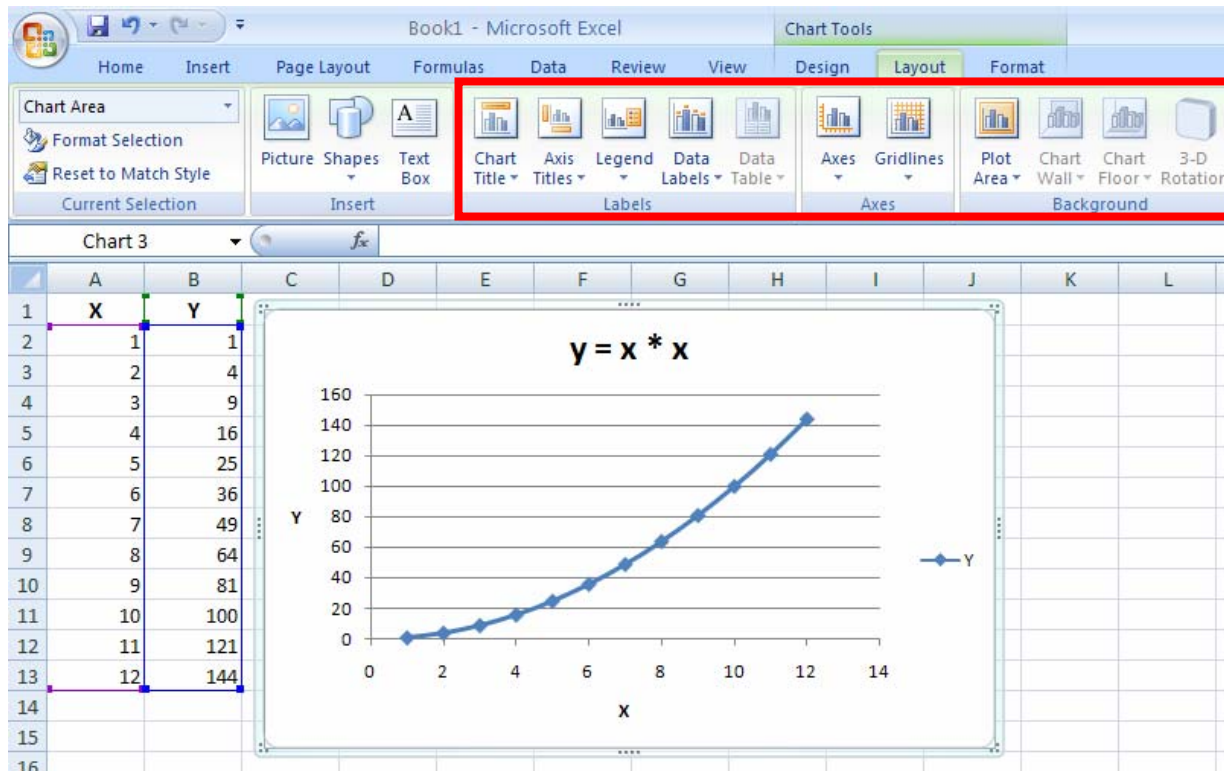
- Select the XY data we entered 
- From the **Insert** tab, click on “Scatter” and select the appropriate type of pie chart, in this case, the “**Scatter with smooth lines and markers**” chart sub-type 
- You should get something like this...

	A	B
1	X	Y
2	1	1
3	2	4
4	3	9
5	4	16
6	5	25
7	6	36
8	7	49
9	8	64
10	9	81
11	10	100
12	11	121
13	12	144



# Making An XY Scatter Plot *cont'd*

- **Recall:** To edit the graph, use the options found under the **Layout** tab. From there you can add/edit the chart title, axis titles, legend, etc..



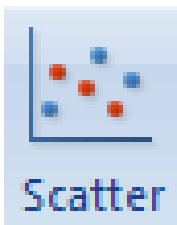


# Reminder: Formatting a Chart

- Everything seen on the chart can be selected, formatted, moved, etc.
- For instance, to change stuff **Right Click on:**
  - The X-Axis, Y-Axis, Plot Area, Chart Area, Gridlines, Data Series, Legend, or Chart Title and select appropriate option that you'd like to edit
  - You'll be able to play around with the **colours**, **fonts**, scale, alignment, numbering, etc... so explore and find out what's possible!





# Line Graphs vs. Scatter Plots



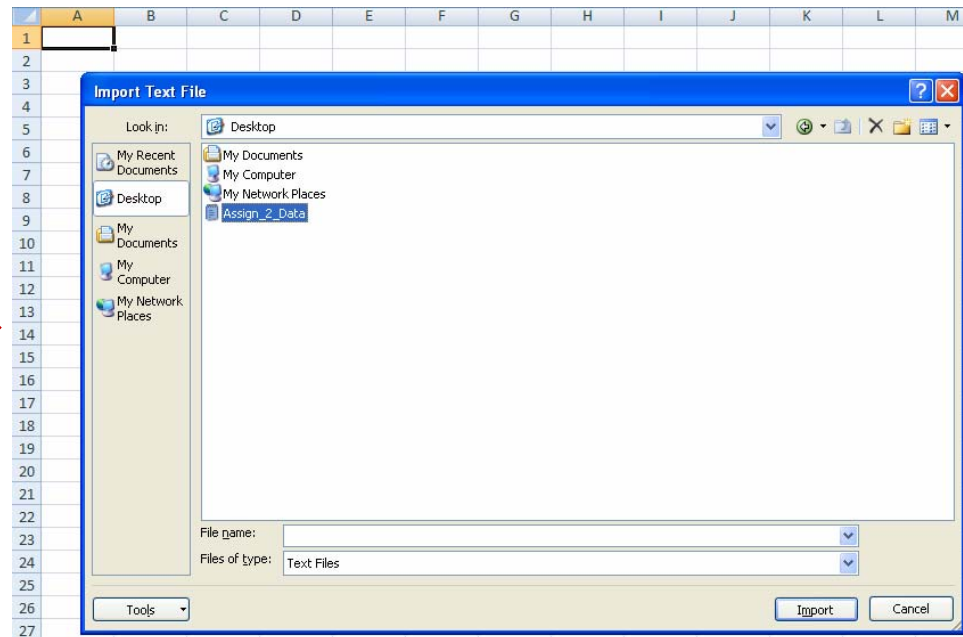
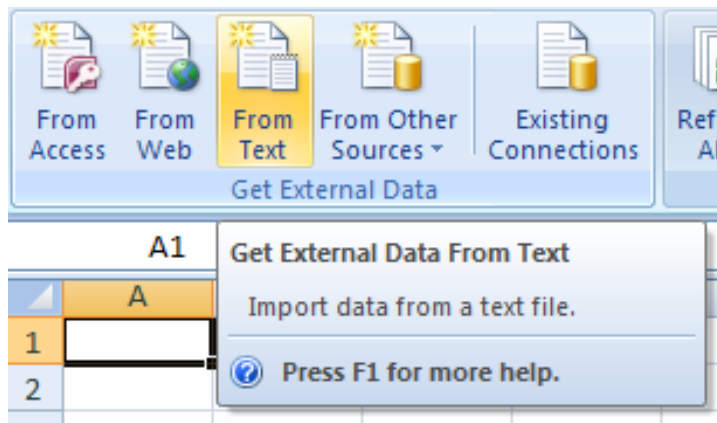
- So what is the difference anyways?
- A Line Graph is almost like a bar graph, except that instead of using bars, it uses points with a line connecting each of the adjacent points together
- An XY Scatter Plot is the familiar type of graph we all do in math where you have an x-axis and a y-axis that are used to represent coordinates.
- As well, on a Line Graph, you can use labels on the x-axis (ex. Toronto, Ottawa, Montreal, etc...) while on a XY Scatter Plot, you can only use numbers (ex. 0, 1, 5.5,  $\frac{1}{2}$ , -0.23, etc..)

# Linking an Excel Chart into Word

- Highlight a chart in Microsoft Excel 
- Copy it
- Open a Microsoft Word document 
- Paste it
  - *Note, if the chart in Excel changes, the chart in Word WILL change as well*

# Importing Data From A Text File

- To import a data from a text file, go to the **Data** tab and look for the “Get External Data” section
- Select the “From Text” option
- Highlight the file and click “Import”



# Importing Data From A Text File *cont'd*

- The Text Import Wizard should open up
- Usually you will want to choose “delimited”, as most files come with some sort of separator between the fields
- Next, select the proper type of delimiter
  - For Assignment #2, you will be using a comma delimited file.
- Now, select “general” as the Data Column Format
- Click on Finish

# Final Notes

- Practise, Practise, Practise!!!
- If you have any problems post in the forum