

# Excel Functions & Tables

Winter 2014

# Review of Functions

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- Quick Mathematics Review
  - As it turns out, some of the most important mathematics for this course revolves around the concepts of exponential and logarithmic functions.
  - **Function** - a relation in which each element in the domain is associated with only one element in the range

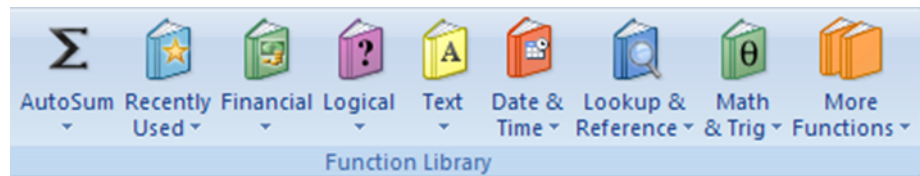
What can you say about the function  $f(x)=x+5$

What are a couple of more simple functions.

# Built-in Functions

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- Functions are special routines provided by Excel to do simple and complex calculations.
- Click on the Formulas Tab to see the following:



- Click on the Math & Trig icon and you will see all of the Excel functions for this category

# Excel Function Syntax

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- The basic syntax for an Excel function is carried over from algebra and includes the following:
  - The function name
  - A left parenthesis
  - A list of arguments where each argument is separated by a comma
  - A right parenthesis
- The INT function rounds a number down to the nearest integer

What is the value of =INT(3.75)

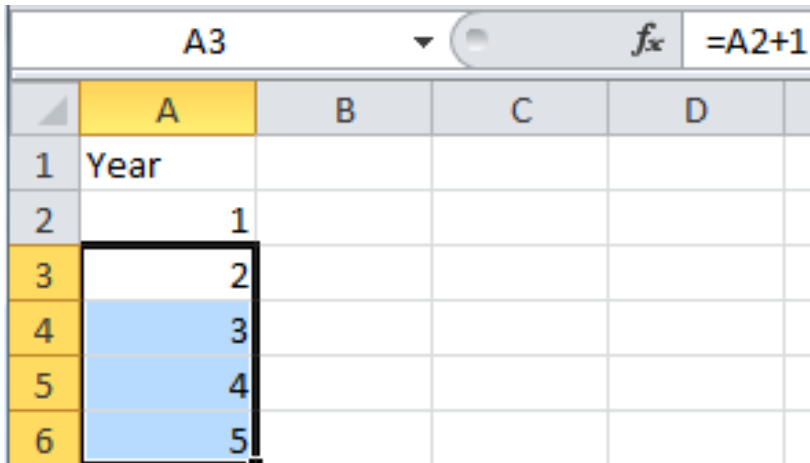
What is the value of =INT(-3.75)

# Problem 3.1

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- Students in a Chemistry class were given an exam and were then tested monthly with an equivalent exam. The average score was given by  $f(x)=80-17\log_{10}(t+1)$ ,  $0 \leq t < 12$ , where  $t$  is the time in months.
  - Design a worksheet called Problem 3.1, using a named variable **month**, that allows the user the ability to enter a time  $t$  in months and calculates the average exam score.
  - Answer each of the following questions in an Excel comment placed in cell D1
    1. What was the average score on the original exam?
    2. What was the average score after 4 months?
    3. What was the average score after 10 months?

# Filling Cells

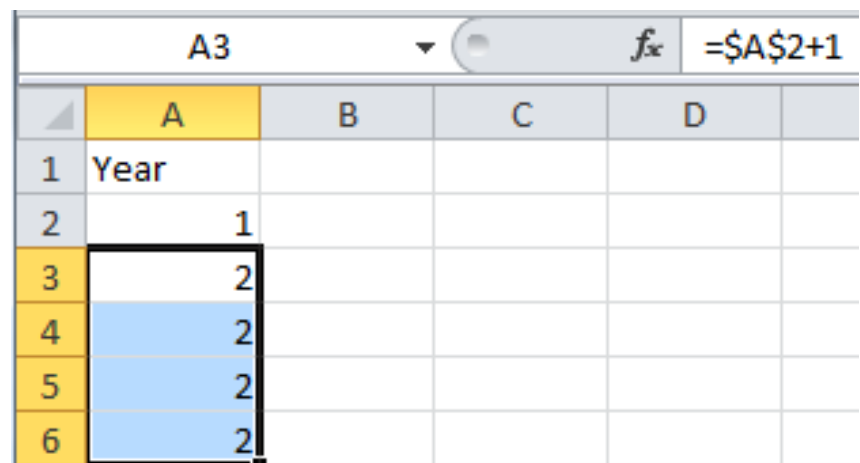
- Many times when creating an Excel worksheet, you want to get some pattern going so you can fill down, right, or both down and right.
- Excel adjusts cell references during the fill based on the reference type.



This screenshot shows an Excel worksheet with a formula bar containing `=A2+1`. The active cell is A3. The worksheet contains the following data:

	A	B	C	D
1	Year			
2	1			
3	2			
4	3			
5	4			
6	5			

The cells in column A from row 3 to row 6 are highlighted in blue, indicating they were filled from the value in A3. The formula bar shows the relative reference `=A2+1`.



This screenshot shows an Excel worksheet with a formula bar containing `=$A$2+1`. The active cell is A3. The worksheet contains the following data:

	A	B	C	D
1	Year			
2	1			
3	2			
4	2			
5	2			
6	2			

The cells in column A from row 3 to row 6 are highlighted in blue, indicating they were filled from the value in A3. The formula bar shows the absolute reference `=$A$2+1`.

# More on Cell References

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- Cell references can be relative, absolute, or a combination of both relative & absolute
- Relative reference - refer to cell references in formulas in relation to the cell that contains the formula. e.g. =A2+1
- Absolute reference - refer to cells in their absolute or fixed position. e.g. =\$A\$2+1
- Combination - either the row is absolute and the column is relative or the row is relative and the column is absolute. e.g. =\$A2+1 or =A\$2+1

# Problem 3.2

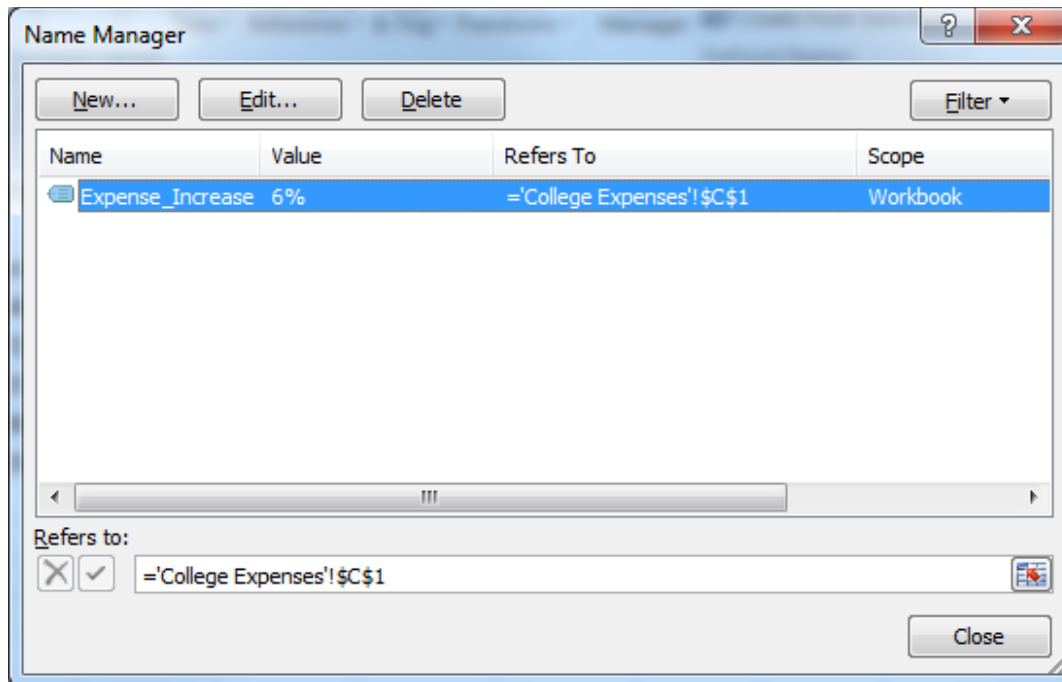
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1. Students in a Chemistry class were given an exam and were then tested monthly with an equivalent exam. The average score was given by  $f(x)=80-17\log_{10}(t+1)$ ,  $0 \leq t < 12$ , where  $t$  is the time in months.
2. Design a worksheet that shows the average score for all values of  $t$  (0 to 11)



# Named Cell Reference

- What kind of cell reference is a named cell?



# Problem 3.3

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An interesting Web site is [www.worldometers.info](http://www.worldometers.info)

Using the population of the world today and the present growth rate of 1.1% per year, design a worksheet that shows the population for each of the next 25 years.

Let's design and then implement

# Problem 3.4

1. The university you are planning on attending your senior year of High School has given you the following average expenses for a typical student.

	A	B	C	D	E
1	Category	Freshmen	Sophomore	Junior	Senior
2	Clothes	\$540.00			
3	Entertainment	\$735.00			
4	Miscellaneous	\$355.00			
5	Room & Board	\$3,480.00			
6	Tuition & Books	\$5,150.00			

2. Assuming a 6% increase in all expenses, finish the above worksheet showing expenses for each of your four years in college

# Problem 3.5 Better Design

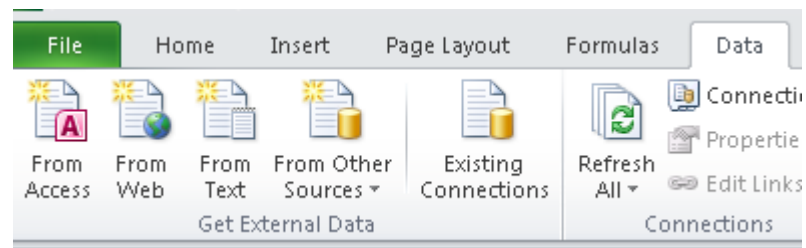
- How would we change the previous worksheet from 6% to 4%?
- A better design

	A	B	C	D	E	F	G	H
1	Category	Freshmen	Sophomore	Junior	Senior	Expense Increase		
2	Clothes	\$540.00					6%	
3	Entertainment	\$735.00						
4	Miscellaneous	\$355.00						
5	Room & Board	\$3,480.00						
6	Tuition & Books	\$5,150.00						

# Problem 3.6 Meteorology

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- A meteorology class found the average weekly temperature for each week of each month for one year. The data follows. You are to find each of the following using an Excel worksheet:
- The average monthly temperature for each month.
- The highest and lowest monthly averages using two functions we have not discussed yet: maximum and minimum. See if you can use the help feature to figure this out.

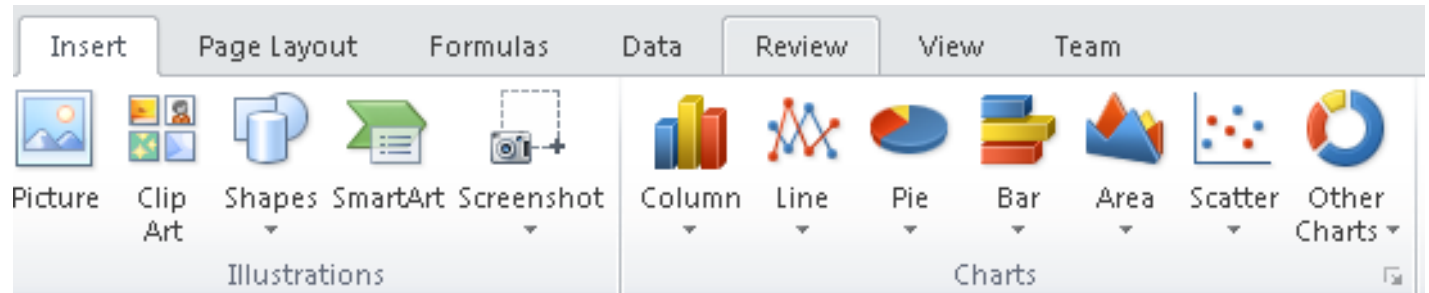


<http://zeus.cs.pacificu.edu/shereen/cs130w14/WeatherTable.html>

Let's import this data from a web page.

Month	Week1	Week2	Week3	Week4
jan	33	36	29	31
feb	37	32	39	38
mar	43	47	38	45
apr	49	51	53	50
may	52	55	54	58
jun	56	62	61	60
jul	65	69	73	70
aug	72	74	68	69
sep	67	66	64	60
oct	63	65	60	59
nov	46	42	45	40
dec	38	35	36	35

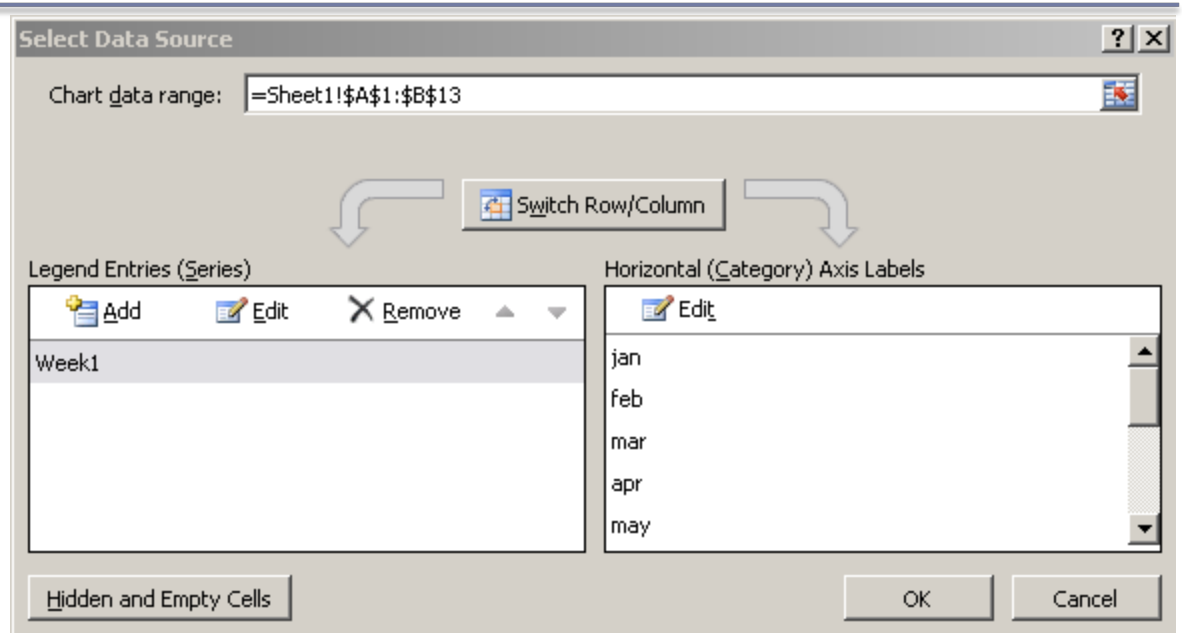
# Let's add a Chart



- Select columns Month and Week 1
- Choose Line
- Let's add the other weeks
- Right Click on the Chart | Select Data

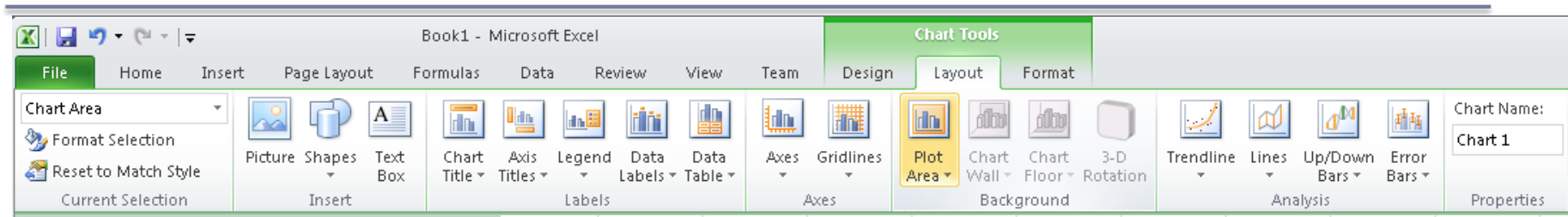
# Add a new Series

- Add
- Series Name
- Series Values

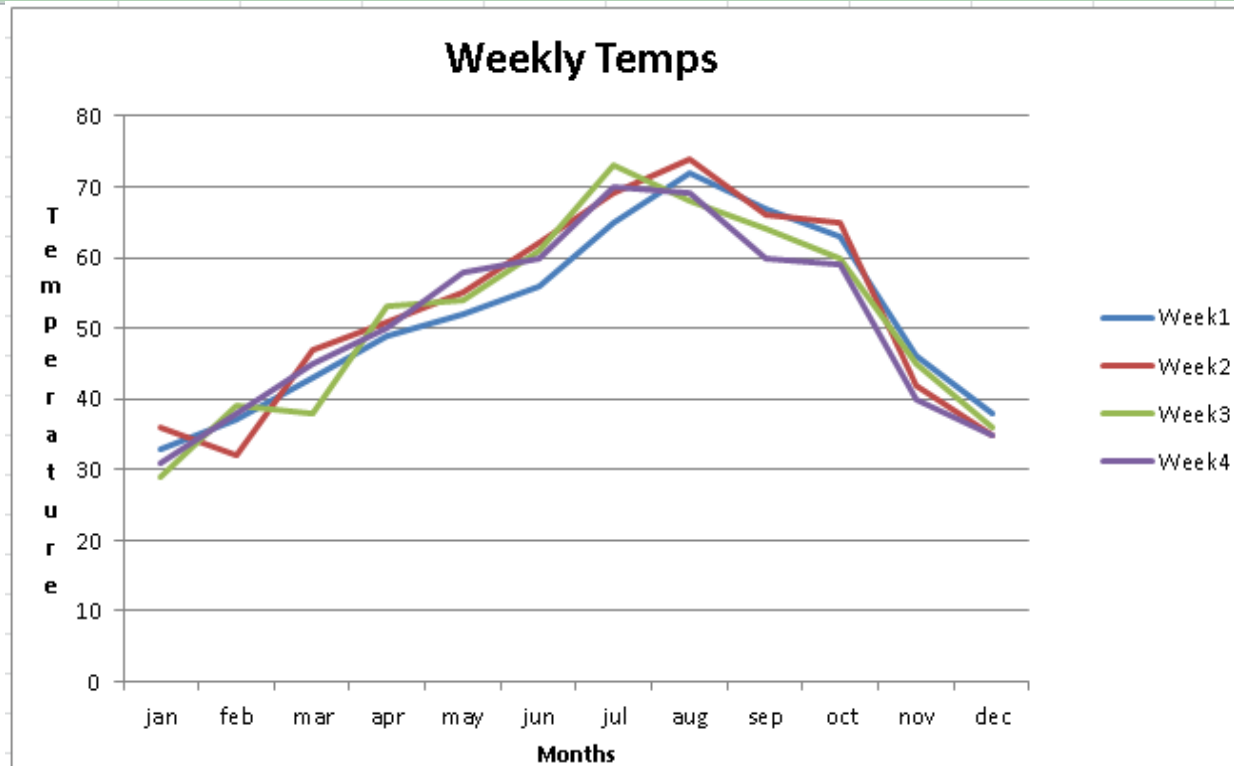




# Format the Chart



- Select the chart
- Chart Tools
  - Layout
  - Chart Title
  - Axis Titles
  - Axes



# Outside Practice

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- Import the table from <http://www.opensecrets.org/bigpicture/index.php>
- Format the data nicely
- Add a row that calculates the average of each column. Add a row to calculate the median.
- Add a column that shows how much more (in \$) Democrats spent than Republicans each year
- Build a line chart that displays this data. The chart should have one line for Ds and one line for Rs.