


Excel Formulas

Instructional Technology

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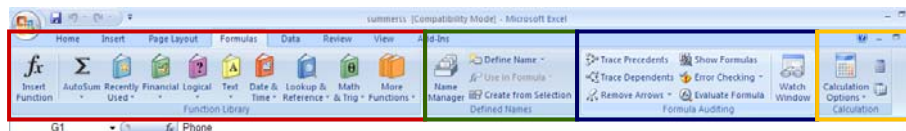
Topics

- Formulas
- Using Multiple Worksheets
- Functions: PMT, FV, Goal Seek & If/Then Statements

What you will Need

- 1 Before you begin this tutorial, click here:
<http://support.uiwtx.edu/MediaTraining/Tutorials.html>
- 2 Download the Zip file For Excel.zip
- 3 The .zip file contains all of the documents necessary to complete the exercises outlined in the instructions.

The Formula tab

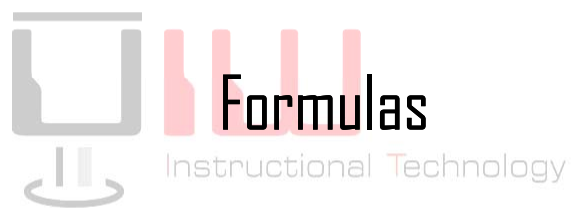


- 1 **The Formula Library:** This is a quick reference to all of the different mathematical functions and operations that can be calculated using Excel.
- 2 **The Defined Names group:** This feature, used in conjunction with the database and filtering features of Excel, creates cell names for use in database filtering.
- 3 **The Formula Auditing group:** This section features options to evaluate and edit complex formulas so that users may locate errors within formulas.
- 4 **The Calculation group:** This function determines when formulas are calculated, either automatically (by default) or manually.

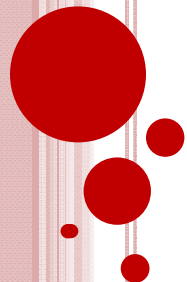
Worksheet Terms



- **Cell:** The intersection of a row and a column.
- **Cell Address:** The combination of letters and number that identifies a cell (A1, B3 etc).
- **Cell Notation:** Method of writing cell formulas, cell addresses, not cell contents are used when writing mathematical formulas for cells.



Math-Excel Style



Formulas

Components of formulas	
=	This tells Excel that you are writing a formula
+	Addition
-	Subtraction
*	Multiplication
/	Division
^	Exponents
()	Parentheses
Order of operations	Parentheses Exponents Multiplication or Division Addition or subtraction
Number keypad	On the right side of the keyboard. Always use with Excel
Spacing	Do not use spaces in formulas

- These are the basic rules of formulas.
- Formula are written in this manner:
=cell address + cell address
- Note that you add the cells, *not the cell content.*
- Note that *spaces are not used in formulas!*

Formulas and Cell Notation

	Clipboard			Font			Alignment	
	A1			123				
	A	B	C	D	E	F	G	H
1	123	5547	785	125	8754	552	5412	
2	254	785	254	25	442	254	5214	
3		125	256		254	1141	5781	
4		254	252			25541	5812	
5			854			2365	2543	
6			5584			214	5226	
7								

- The **Name Box** displays the cell name of a selected cell
- The **Formula Bar** shows the formula being entered a cell
- Formulas can be entered in the formula bar or in a cell
- Formulas can be copied to the formula bar
- Formulas can be edited in the formula bar

Formulas



Open the worksheet **Formulas**

Adding Multiple Cells

- 1 Select Cell **B8**
- 2 Type **=B1+B2+B3+B4**
in the formula Bar
- 3 Press ENTER

Sum Function

- 1 Select Cell **C8**
- 2 Type **=SUM(C1:C6)**
- 3 Press ENTER

Formulas



The Point and Click method of adding cells

- 1 Select Cell **E8**
- 2 Type an =
- 3 Click Cell **E1**
- 4 Type +
- 5 Click Cell **F2**
- 6 Type +
- 7 Click Cell **E3**
- 8 Type +
- 9 Press ENTER

Formulas



Auto Average

- 1 Select Cells G1–G6
- 2 Click Selector next to the Auto Sum Icon Σ on the Drop Down menu
- 3 Choose **Average**

Formulas



Auto Sum

- 1 **Open and Tile the Boston, Atlanta, Chicago and National Sales Worksheets**
- 2 Click on the tab for New York
- 3 Select cells **B4-B7**
- 4 Click the selector next to the Auto Sum Icon Σ on the Drop Down menu
- 5 Choose **SUM**



Formulas for Multiple Worksheets

- 1. Open the **National Totals Worksheet**, and click **Cell B7**
- 2. Type **=SUM(**
- 3. Hold down the CTRL Key and Click in Cell **B7** of the **Chicago Worksheet**
- 4. Click **B7** Again
- 5. Type a **+** sign
- 6. Repeat the process for cells **B7** in **Atlanta**, and **Boston**
- 7. Type a **)**
- 8. Look at the total in cell B7 of **National Sales**



Formulas for Multiple Worksheets

- 1. Hold down the **Ctrl + `** keys at the same time to display a formula
- 2. Look at the Formula **=SUM(Chicago!B7+'Atlantas'!B7+Boston'!B7)**
- 3. The **!** Means that the formula spans across worksheets.
- 4. Formulas may also span across workbooks using the same method, However all of the workbooks must be open

Copy Formulas



- 1. Click cell **B7** in the **National Worksheet**
- 2. Move the mouse to the **Bottom Right** corner, so that it becomes a black + sign
- 3. Click and drag the mouse from **B7** to **G7**
- 4. The formula copies in each cell

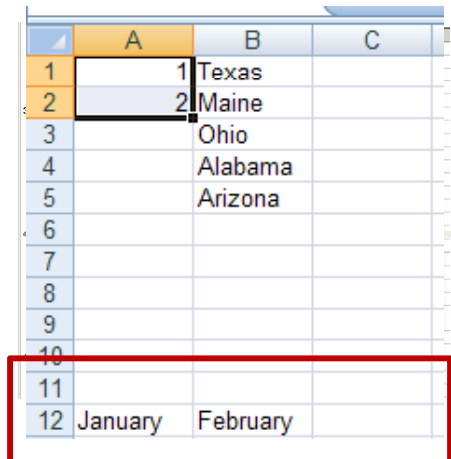
Trends



	A	B	C
1		Texas	
2		Maine	
3		Ohio	
4		Alabama	
5		Arizona	
6			
7			
8			
9			
10			
11			
12	January	February	

- 1. Open **"Trends"**
- 2. Select Cells **A1 & A2**
- 3. Hold the mouse over the bottom right corner until the pointer becomes a **thin + sign**
- 4. Drag the mouse down to cell **A10**
- 5. Repeat the process in column **B**, **Highlighting Cells B1-B5**

Trends



	A	B	C
1		1 Texas	
2		2 Maine	
3		Ohio	
4		Alabama	
5		Arizona	
6			
7			
8			
9			
10			
11			
12	January	February	

- ① Select Cells **A12 & B12**
- ① Repeat the previous process, but drag across to column **G**

Date Functions

Open the worksheet **Dates**

- ① In cell **B1**, Type **=TODAY()** This calculates today's date
- ① In cell **B3**, Type your **date of birth**
- ① In cell **B5**, Type **=INT((TODAY()-B3)/365)** This will give you your age (Don't Lie)
- ① In cell **B7** Type **=NOW()** This calculates the current date and time
- ① Current date and time can be calculated on the keyboard:
 - ① Date: **CTRL+;**
 - ① Time: **CTRL+SHIFT+;**
 - ① Both: **CTRL+; SPACE, then CTRL+SHIFT+;**



Absolute and Relative Cell References

- When copying and pasting cell formulas, some cell values may vary each time a formula is copied, while other cell values remain constant during the same copy process.
- **Relative reference** refers to cell values that vary as a formula is copied from cell to cell.
- **Absolute Reference** refers to cell values that remain constant as a formula is copied from cell to cell. An **absolute reference** is noted by a dollar sign in front of the Row and Column designation of the cell address: **\$B\$5**.



Absolute Reference

- Open the worksheet **Absolute**
- Hold down the **Ctrl + `** keys to display the formulas
- When calculating cell values using absolute references, it is best to use the pointing method.
- We are going to calculate the future value of cell **C5**.
- **C5** is the value of cell **B5** when a cost increase of 10% is added to the cost of goods sold
- 10% is the value of cell **D24** and is an **Absolute Reference**



Absolute Reference in a Formula

- 1 Click in Cell **C5**.
- 2 Type =(
- 3 Click cell **B5**
- 4 Type a + sign
- 5 Click in cell **B5** again,
- 6 Type *
- 7 Click **D24**
- 8 Push the **F4** key to set the absolute reference
- 9 Type) and **Enter**
- 10 The answer is **\$8250.00**



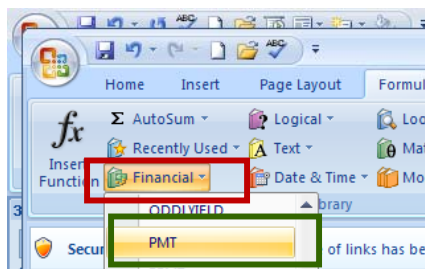
Financial Functions

- 1 **PMT** Calculates periodic payments,
 - 2 i.e. How much will it cost to pay off a car if I finance \$\$ at 48 months with \$\$ down?
- 3 **FV** calculates future value,
 - 4 i.e. if I save \$\$ per month over 40 years, how much money will I have when I retire?
- 5 **Goal Seek**- A command that lets you enter the end result (\$\$ Payment) and from that determine how much you can spend to get that payment

Payment (PMT)

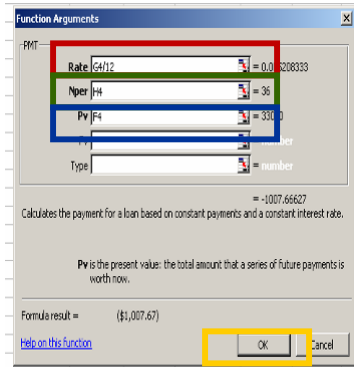
- ④ The PMT function requires arguments supplied as cell references
 - ④ Interest rate per period
 - ④ Term of loan
 - ④ Amount of loan (as a negative value)
- ④ Payment is equal annual interest rate/12, term (# months or # years x 12), -amount of loan as a negative value.
- ④ Expressed in **CELL NOTATION**

PMT



- ④ Open the Worksheet **Car**
- ④ Calculate the amount financed in cells **E4 & F5**
- ④ Click in cell **H4**
- ④ Choose the **Formula tab**.
- ④ Locate **Financial** in the **Function Library**
- ④ Choose **PMT** from the list

PMT



- ➊ In **Rate**, click cell **G4** and type **/12** (Interest rate /12 months)
- ➋ In **Nper**, click cell **H4** (the calculation is for 36 month term, if the term is 3 years, reflect the term by multiplying the cell value by 12. (G4 * 12)
- ➌ In **Pv**, click in cell **H4** (the value calculated as the price less trade and down payment)
- ➍ Type a **-** sign before **F4**
- ➎ Click **OK**

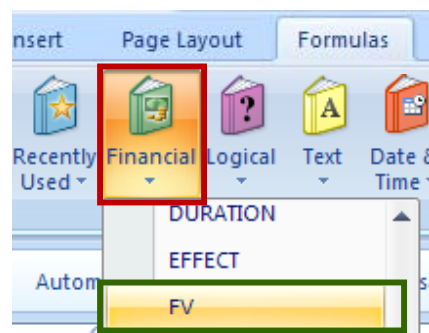
Future Value (FV) Function

- ➊ Future value of an investment based on
 - ➋ constant periodic payments
 - ➌ Constant interest rate
- ➍ There are still 3 Arguments
 - ➎ Amount at retirement = Future Value, V (rate or return) , -Periodic Payment
 - ➏ Expressed in **CELL NOTATION**

FV

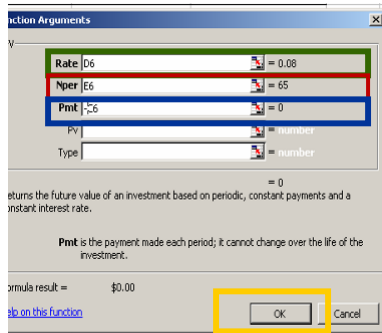
- 1. Open the Worksheet **FV**
- 2. Click cell **E8**.
- 3. Type **=**(and click in **B2**
- 4. Express **B2** as an Absolute Reference and subtract it from **B8**, then type **)**
- 5. This will calculate the number of years you will contribute to your retirement

FV



- 1. Click in cell **F8**
- 2. Choose the **Formula** tab
- 3. Locate **Financial** in the **Function Library**
- 4. Choose **FV** from the list

FV

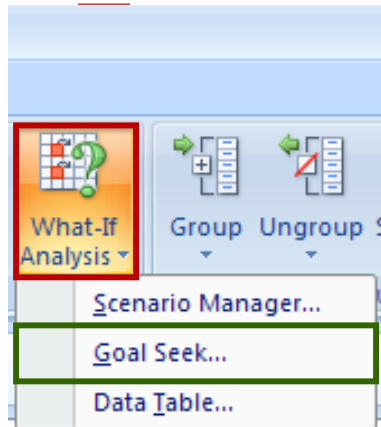


- 🔴 In **Rate**, click cell **D8**
- 🔴 In **Nper**, click cell **E8**
- 🔴 In **PMT**, click in cell **C8**
Type a – sign before **C8**
- 🔴 Click **OK**
- 🔴 Type your age in **B6** and **\$3,000** in cell **C6** the value in **F6** is **\$90,972.85**

Goal Seek

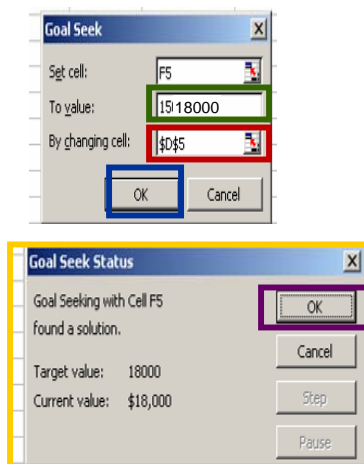
- 🔴 Goal seek will allow you to set the end result in order to determine the input
- 🔴 Using the car financing example, I want to know how much I need to receive for my trade-in (**D5**) to finance \$18,000 (**F5**) (assuming that my down payment is the same).

Goal Seek



- 1 In the **Car** worksheet, click cell **F5**
- 2 On the **Data** tab, locate **What-If Analysis**
- 3 Choose **Goal Seek**.

Goal Seek



- 4 Click In **To Value**, type **18,000**
- 5 Click in **By changing cell**, and click in cell **D5**
- 6 Click **OK**
- 7 The **Goal Seek Status** dialogue opens
- 8 Look in cell D5 for the new value **\$4,500**
- 9 Click **OK**



Questions?

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