

MODULE 1

INTRODUCTION

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FORMULA LIBRARY:

Includes a list of all common formulas, component parts, and brief descriptions of how each formula works

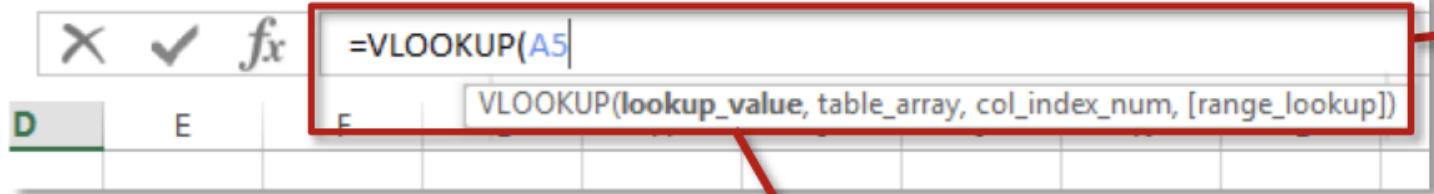
AUDITING TOOLS:

- Trace Precedents/Dependents** shows which cells affect or are affected by the value of the selected cell
- Show Formulas** displays all of the formulas in the sheet as text
- Evaluate Formula** allows you to step into a formula and determine the output of each component

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Formula Syntax



All Excel formulas start with a **=** and can either be selected from the formula library or typed directly into the formula bar

As you begin to type a formula, a pop-up will appear to guide you through each step, shown in bold

A1

Single-cell references describe a **cell's location within a worksheet**, in terms of the intersection between a column (A through XFD), and a row (1 through 1,048,576)

A	B	C
1		
2		
3		
4		
5		

A1:C4

Array references describe a contiguous group of cells based on the location of the top-left (A1) and the bottom-right (C4) cells, **separated by a ":"**



A	B	C
1		
2		
3		
4		
5		

A1,C4

Non-contiguous references describe selections of individual cells that do not share a common border, **separated by a ","**

A	B	C
1		
2		
3		
4		

Reference Type

Hold the phone, how come some cell references include a “\$”?

These are used to create **Fixed, Relative, or Mixed References**; the \$ basically locks a specific cell range or reference so that it does not change if you apply the formula to other cells.

For Example:

\$A\$1 = Fixed column, Fixed row

A\$1 = Relative column, Fixed row

\$A1 = Fixed column, Relative row

A1 = Relative column, Relative row



PRO TIP:

Select part of your formula with the **cursor and use “F4” to quickly scroll** through reference types. **ALWAYS THINK ABOUT YOUR REFERENCES**

	A	B	C
1	\$A\$1		
2			
3			
4			\$A\$1
5			

	A	B	C
1	\$A1		
2			
3			
4			\$A4
5			

	A	B	C
1	A\$1		
2			
3			
4			C\$1
5			

	A	B	C
1	A1		
2			
3			
4			C4
5			

MAC Shortcut keys

Mac Shortcut	Purpose	PC Equivalent
Command-T	Cycles between cell reference types	F4
Command-Y	Repeats the last user action	F4
Control-U	Displays cell ranges tied to a given formula	F2
Command-Arrow	Jumps to the edge of a contiguous data array	CTRL-ARROW
Command-Shift-Arrow	Extends a selection to the edge of a data array	CTRL-SHIFT-ARROW
Command-Fn-Up/Down	Jumps between workbook tabs	CTRL-PAGE UP/DOWN

Common Errors

Error Type	What it means	How to fix it
#####	<i>Column isn't wide enough to display values</i>	Drag or double-click column border to increase width, or right-click to set custom column width
#NAME?	Excel does not recognize text in a formula	Make sure that function names are correct, references are valid and spelled properly, and quotation marks and colons are in place
#VALUE!	Formula has the wrong type of argument	<i>Check that your formula isn't trying to perform an arithmetic operation on text strings or cells formatted as text</i>
#DIV/0!	Formula is dividing by zero or an empty cell	Check the value of your divisor; if 0 is correct, use an IF statement to display an alternate value if you choose
#REF!	Formula refers to a cell that is not valid	<i>Make sure that you didn't move, delete, or replace cells that are referenced in your formula</i>

IF ERROR

The **IFERROR** statement is an excellent tool to eliminate annoying error messages (#N/A, #DIV/0!, #REF!, etc.), which is particularly useful for front-end formatting

=IFERROR(value, value_if_error)

Formula or value (which may or may not result in an error)

Value returned in the case of an error

In this case we're replacing an error caused by the A1/B1 formula with "Invalid Formula", and an error caused by a VLOOKUP function with "-"

{ =IFERROR(A1/B1,"Invalid Formula")
=IFERROR(VLOOKUP(A1,D1:E4,2,0),"")



PRO TIP:

If you're writing a formula that may trigger an error (i.e. a VLOOKUP where not all values have a match), WRITE THE FULL FORMULA FIRST then wrap it in an IFERROR statement

Function Shortcuts

The **F4** function is used for two helpful shortcuts:

- 1) Adding or modifying cell reference types

With your cursor selecting any cell reference or array within a formula, the F4 key will cycle through fixed, relative, and absolute reference types



- 2) Repeating your last command or action ↵

F4 will also repeat the last user action, such as inserting/deleting rows or columns, changing cell format or style, etc. (Note: F4 will not repeat entered values or formulas)

The **F2** function displays the cell ranges that are tied to a given formula



PRO TIP:

Use **F2** to help diagnose formula errors or make quick adjustments to cell references and arrays

CTRL Shortcuts

The **CTRL** function can be combined with a variety of keys, such as:

1) CTRL- ARROW

Jumps to the left, right, top, or bottom edge
(i.e. last non-blank cell) of a contiguous data array

2) CTRL-SHIFT-ARROW

Extends a selection to the left, right, top, or bottom
edge (i.e. last non-blank cell) of a data array

3) CTRL-PAGE UP/DOWN

Jumps between tabs of a workbook

The screenshot shows three separate Excel spreadsheets demonstrating keyboard shortcuts:

- Top Spreadsheet (Captioned "CTRL-SHIFT-RIGHT ARROW"):** A 12x8 grid of data. A green selection box highlights the range from A1 to G1. A second green selection box highlights the range from A1 to H1.
- Middle Spreadsheet (Captioned "CTRL-SHIFT-DOWN ARROW"):** A 12x8 grid of data. A green selection box highlights the range from A1 to A11. A second green selection box highlights the range from A1 to G11.
- Bottom Spreadsheet:** A 12x8 grid of data. A green selection box highlights the range from A1 to A11. A second green selection box highlights the range from A1 to G11.

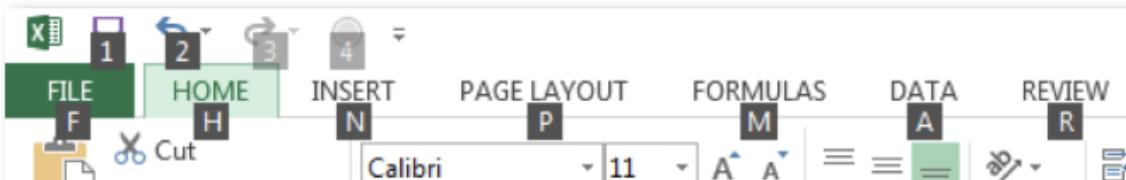
The data in the grids is as follows:

	A	B	C	D	E	F	G	H
1	77	847	482	847	916	329	796	
2	183	852	286	275	177	476	224	
3	252	117	134	865	242	822	705	
4	711	507	125	910	348	529	491	
5	842	12	837	491	221	595	369	
6	782	39	906	245	286	753	964	
7	820	678	473	777	172	655	984	
8	321	164	803	461	225	560	652	
9	374	447	395	232	741	847	482	847
10	891	966	861	898	712	183	852	286
11	718	775	635	817	553	117	134	865
12					3	252	125	910
13					4	711	507	348
					5	842	12	529
					6	782	39	491
					7	820	678	221
					8	321	473	595
					9	374	395	369
					10	891	232	964
					11	718	775	984
					12			

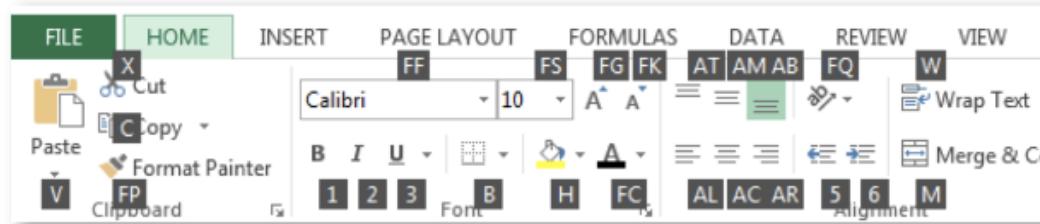
Alt Keys

The **ALT** function enables **Key Tips**, which allow you to access any function in the ribbon using keyboard shortcuts (Note: you do not need to hold down ALT)

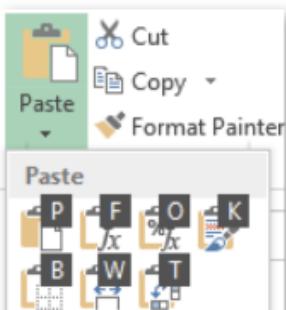
- 1) Press **ALT** to reveal tab-level shortcuts:



- 2) Press the key for the tab you want (i.e. **H**) to reveal additional shortcuts:



- 3) Continue to press shortcut keys (i.e. **V**) to drill into specific functions:



PRO TIP:

Use **ALT-H-V-V** to paste as values or **ALT-H-V-F** to paste as formulas

Data Validation

Data Validation allows you to specify exactly what types of values a cell can contain (i.e. whole numbers, positive integers, values from a list, etc.)

One of the most useful forms of data validation is **LIST**, which creates a drop-down menu of options based on a source list that you specify:

(but the best part is that you can write your own hilarious error messages) See, Excel can be fun!

