

Excel

Formulas and Functions

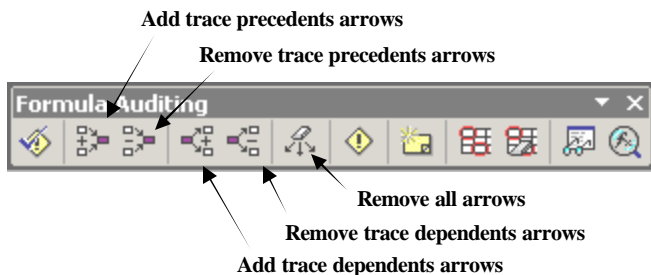
Mathematical symbols used in formulas:

= + - / * < > () &

Trace Precedents/Dependents

The best way to see if your formulas are pulling values from the correct cells is to activate the Formula Auditing toolbar and then turn on arrows for Trace Precedents (cells that feed into the formula) or Trace Dependents (cell that depend on this formula). These arrows show which cells are being used to build formulas and can greatly reduce troubleshooting time. To open the Formula Auditing Toolbar:

View >> Toolbars >> Formula Auditing



Formulas Between Sheets/Files

Excel allows you to create formulas that bring in values from other sheets in the same workbook or from sheets in other Excel files. You must first open any files you would like to include in your formula. The easiest way to build a formula using cell references from other sheets or files is to:

- 1) Start your formula using the = symbol
- 2) Use your mouse to locate and click the cell you would like to include in the formula.
- 3) Include any needed mathematical symbols.
- 4) Hit **Enter** when you are done. Excel inserts the appropriate code for you.

Examples

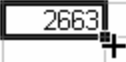
=Sheetname!B4+'Sheetname'!B5

=[Filename.xls]Sheetname!\$B\$139/0.25

Need more help?

Contact Laura Ballard in the CTL
laura.ballard@mail.mc.maricopa.edu
480-461-7690

Multiple Formulas Quick and Easy!

AutoFill - The quickest and easiest way to copy formulas to adjacent cells is to use AutoFill. Find the square at the bottom right of your active cell and just click and drag! 

Ctrl-Enter - If you know you'll need a similar formula entered into a group of cells, first select all of the cells, type in the formula, and then click Ctrl-Enter. The formula will appear in all of the cells you selected.

Absolute vs. Relative cell reference


Relative - By default, all cell references you enter in Excel formulas are relative cell references. This means if you copy the formula to a different location in the spreadsheet, the cell references will automatically change to reflect the formula's new placement. *Example: D22*

Absolute - If you would like to copy a formula to a new location and have a cell reference remain constant, you must indicate this to Excel by using the \$ symbol. A cell reference that remains constant is called an absolute cell reference. When modifying a Relative reference to be an absolute reference, click the formula bar and use the **F4** key to insert the \$ symbols. *Example: \$D\$22*
The \$ symbols indicates that Excel should always go directly to column D and row 22.


Name a Range of Cells

Excel allows you to select a range of cells and give them a name. Once you've done this, you can quickly find that range again or use the named range in a formula.

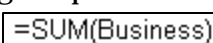
To name a range:

- 1) Select a group of cells. 
- 2) Click in the Name Box and type a name for the cell group (no spaces allowed).
- 3) Click Enter.

To find a named range:

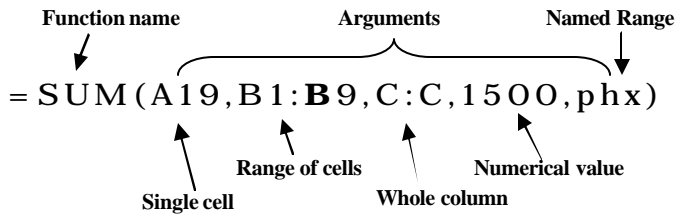
- 1) Click the drop down arrow next to the name box. A list of named ranges will appear. 
- 2) Select the name you want to find.

To use a named range in a formula.

- 1) Begin your formula as normal.
- 2) Type in the name of the range in place of the cell references. 


What's in a Function?

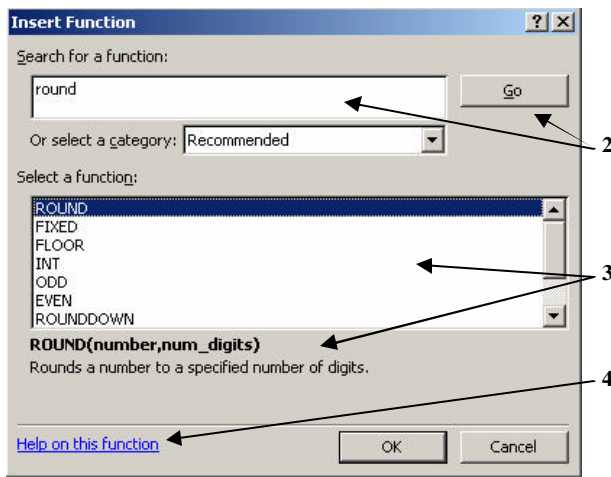
It's important to understand the parts of a function so that you can modify it to meet your needs. You should also know about all of types of arguments a function could have.



Finding New Functions to Use

The Insert Function feature in Excel is excellent way to find a function that does exactly what you are looking for.

- 1) Click the Insert Function button  to the left of the Formula Bar to open the dialog box.
- 2) Type a description of what you want to do and then click GO.
- 3) A list of recommended functions will appear. Click each function to read its description.
- 4) Click the **Help on this function** link if you need an explanation and example of how to use the selected function.



Some Common Functions

NOW =NOW()

Returns the serial number of the current date and time. This function requires no arguments. It is not updated continuously.

COUNT =COUNT(value1)

Counts the number of cells that contain numbers. This function can accommodate up to 30 arguments.

COUNTA =COUNTA(value1)

Counts the number of cells that are not blank (can contain numbers, text, formulas, etc.). This function can accommodate up to 30 arguments.

COUNTIF =COUNTIF(range,criteria)

Counts the number of cells within a range that meet the given criteria.

IF =IF(test,truevalue,falsevalue)

Use IF to conduct conditional tests on values and formulas. This function returns one value if a condition you specify evaluates to TRUE and another value if it evaluates to FALSE. Up to seven IF functions can be nested to construct more elaborate tests.

- **Test** - any expression that can be evaluated to TRUE or FALSE. For example, `A10=100` is a logical expression; if the value in cell A10 is equal to 100, the expression evaluates to TRUE. Otherwise, the expression evaluates to FALSE. This argument can use any comparison calculation operator.
- **Truevalue** - the value returned the test is TRUE.
- **Falsevalue** - the value returned if the test is FALSE.

AND, OR, NOT

These functions are commonly used with the IF function to create more elaborate tests. One of these functions would be used as the test. The AND and OR functions may hold a maximum of 30 arguments, but the NOT function can only hold one argument.

Examples:

`=IF(AND(A1>10,B1>10),"yes","no")`

`=IF(NOT(C1="F"),"You passed!","Sorry you failed")`

ROUND =ROUND(number,num_digits)

Rounds a number to a specified number of digits. For the **number** argument you can either enter a number or a cell reference. For the **num_digits** argument you need to specify the number of digits to which you want to round. If **num_digits** is greater than zero, then number is rounded to the specified number of decimal places. If **num_digits** is 0, then number is rounded to the nearest integer. If **num_digits** is less than 0, then number is rounded to the left of the decimal point.

Examples:

`=ROUND(123.45,1)` will equal 123.5

`=ROUND(123.45,0)` will equal 123

`=ROUND(123.45,-2)` will equal 100

Combining Cell Info

Sometimes you may find it useful to take data from two or more cells and combine it into a new cell.

You may also wish to add text to this final combination. Excel can do this for you using the & symbol. Here's a sample. Assume the D column holds a list of salespersons and the E column holds a list of percentages.

Formula: `= D1 & " earned " & E1 & " over quota."`

Result: Mike Smith earned 5% over quota.