
Microsoft Excel
Introduction to
Formulas and Functions
Part Two



Supporting development of your career

Introduction:

Microsoft Excel is a spreadsheet program designed for everyday tasks such as setting up a budget, maintaining an address list, or keeping track of a list of to-do items.

Within Excel are a wide range of 'functions' which allow you to manipulate and process data to produce the outcomes you desire. Excel also allows you the user to produce a wide range of charts and graphs to support the data functions

Please open and save a new Microsoft Excel Spreadsheet to allow interaction

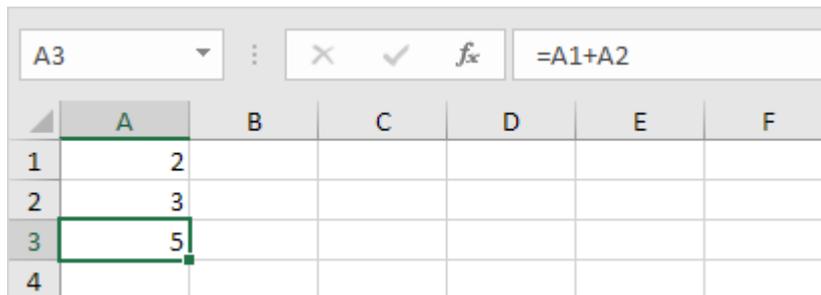
Use the Filename 'Excel-Introduction'

Chapter 2: Formulas and functions

In this section we are looking at how you: enter a function, edit a formula, operator precedence, copy/paste a formula and insert a function

A formula is an expression which calculates the value of a cell. Functions are predefined formulas and are already available in Excel.

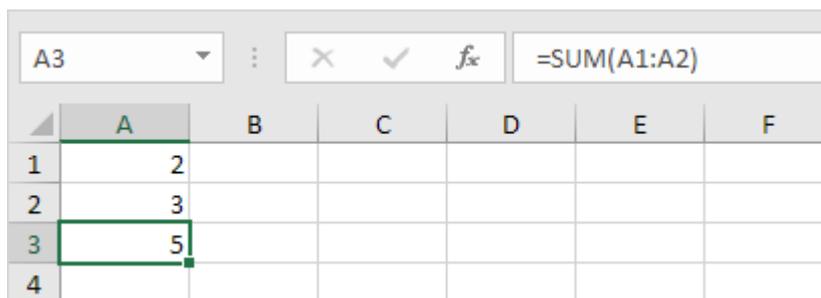
For example, cell A3 below contains a formula which adds the value of cell A2 to the value of cell A1.



The screenshot shows the Excel interface with the formula bar at the top displaying `=A1+A2`. Below the formula bar is a grid of cells. Cell A1 contains the value 2, cell A2 contains the value 3, and cell A3 contains the value 5. The grid has columns labeled A through F and rows labeled 1 through 4.

	A	B	C	D	E	F
1	2					
2	3					
3	5					
4						

For example, cell A3 below contains the SUM function which calculates the sum of the range A1:A2.



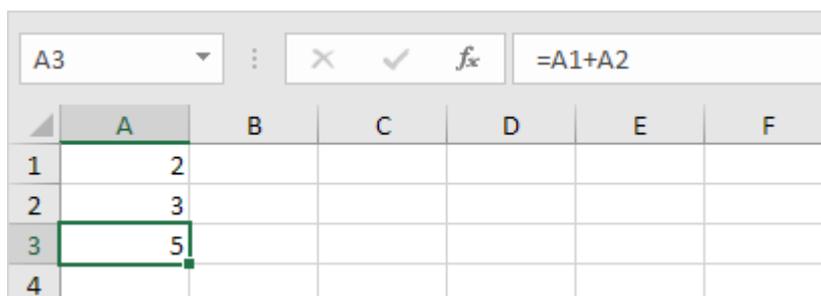
The screenshot shows the Excel interface with the formula bar at the top displaying `=SUM(A1:A2)`. Below the formula bar is a grid of cells. Cell A1 contains the value 2, cell A2 contains the value 3, and cell A3 contains the value 5. The grid has columns labeled A through F and rows labeled 1 through 4.

	A	B	C	D	E	F
1	2					
2	3					
3	5					
4						

Enter a Formula

To enter a formula, execute the following steps.

1. Select a cell.
2. To let Excel know that you want to enter a formula, type an equal sign (=).
3. For example, type the formula `A1+A2`.



The screenshot shows the Excel interface with the formula bar at the top displaying `=A1+A2`. Below the formula bar is a grid of cells. Cell A1 contains the value 2, cell A2 contains the value 3, and cell A3 contains the value 5. The grid has columns labeled A through F and rows labeled 1 through 4.

	A	B	C	D	E	F
1	2					
2	3					
3	5					
4						

Tip: instead of typing A1 and A2, simply select cell A1 and cell A2.

4. Change the value of cell A1 to 3.

	A	B	C	D	E	F
1	3					
2	3					
3	6					
4						

Excel automatically recalculates the value of cell A3. This is one of Excel's most powerful features!

Edit a Formula

When you select a cell, Excel shows the value or formula of the cell in the formula bar.

	A	B	C	D	E	F
1	2					
2	3					
3	5					
4						

1. To edit a formula, click in the formula bar and change the formula.

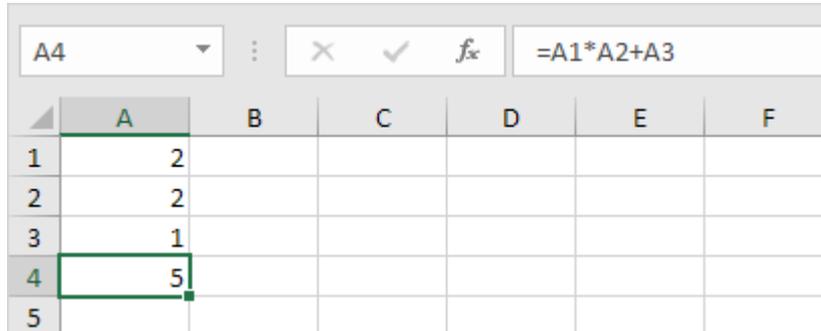
	A	B	C	D	E	F
1	2					
2	3					
3	-1					
4						

2. Press Enter.

	A	B	C	D	E	F
1	2					
2	3					
3	-1					
4						
5						

Operator Precedence

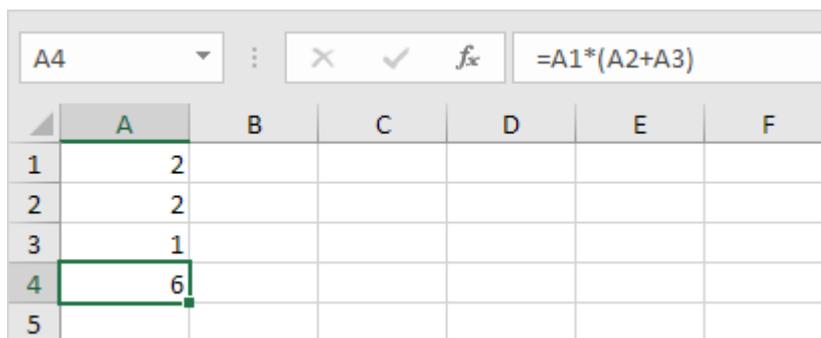
Excel uses a default order in which calculations occur. If a part of the formula is in parentheses, that part will be calculated first. It then performs multiplication or division calculations. Once this is complete, Excel will add and subtract the remainder of your formula. See the example below.



	A	B	C	D	E	F
1	2					
2	2					
3	1					
4	5					
5						

First, Excel performs multiplication ($A1 * A2$). Next, Excel adds the value of cell A3 to this result.

Another example,



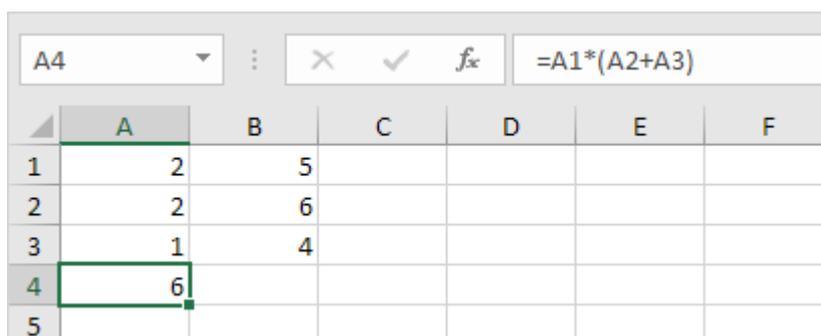
	A	B	C	D	E	F
1	2					
2	2					
3	1					
4	6					
5						

First, Excel calculates the part in parentheses ($A2+A3$). Next, it multiplies this result by the value of cell A1.

Copy/Paste a Formula

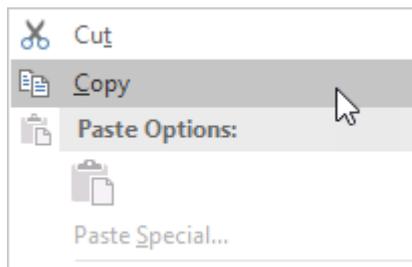
When you copy a formula, Excel automatically adjusts the cell references for each new cell the formula is copied to. To understand this, execute the following steps.

1. Enter the formula shown below into cell A4.

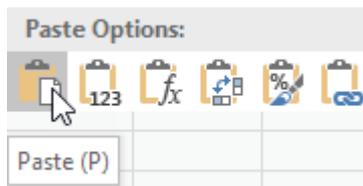


	A	B	C	D	E	F
1	2	5				
2	2	6				
3	1	4				
4	6					
5						

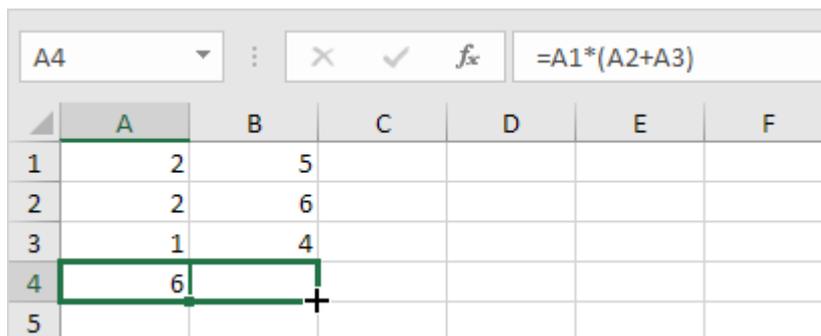
2a. Select cell A4, right click, and then click Copy (or press CTRL + c)...



...next, select cell B4, right click, and then click Paste under 'Paste Options:' (or press CTRL + v).

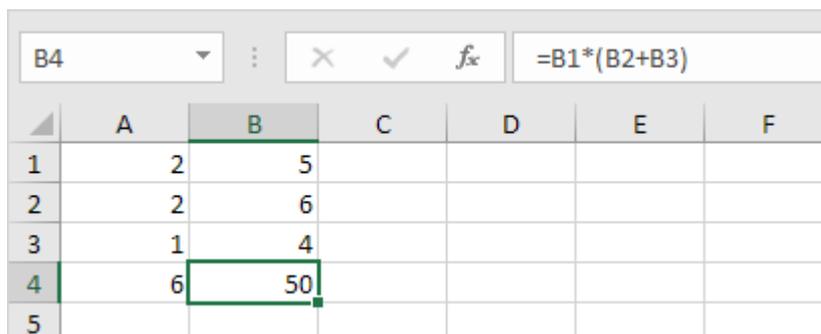


2b. You can also drag the formula to cell B4. Select cell A4, click on the lower right corner of cell A4 and drag it across to cell B4. This is much easier and gives the exact same result!



	A	B	C	D	E	F
1	2	5				
2	2	6				
3	1	4				
4	6					
5						

Result. The formula in cell B4 references the values in column B.



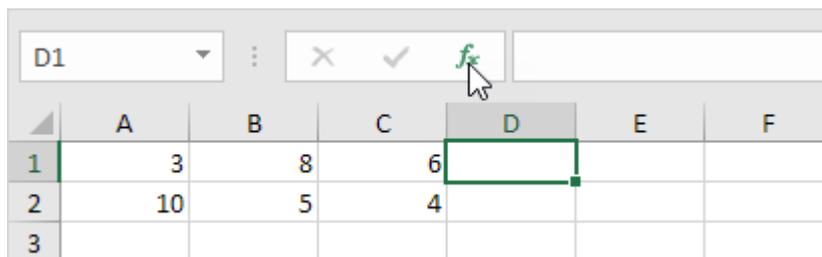
	A	B	C	D	E	F
1	2	5				
2	2	6				
3	1	4				
4	6	50				
5						

Insert a Function

Every function has the same structure. For example, SUM(A1:A4). The name of this function is SUM. The part between the brackets (arguments) means we give Excel the range A1:A4 as input. This function adds the values in cells A1, A2, A3 and A4. It's not easy to remember which function and which arguments to use for each task. Fortunately, the Insert Function feature in Excel helps you with this.

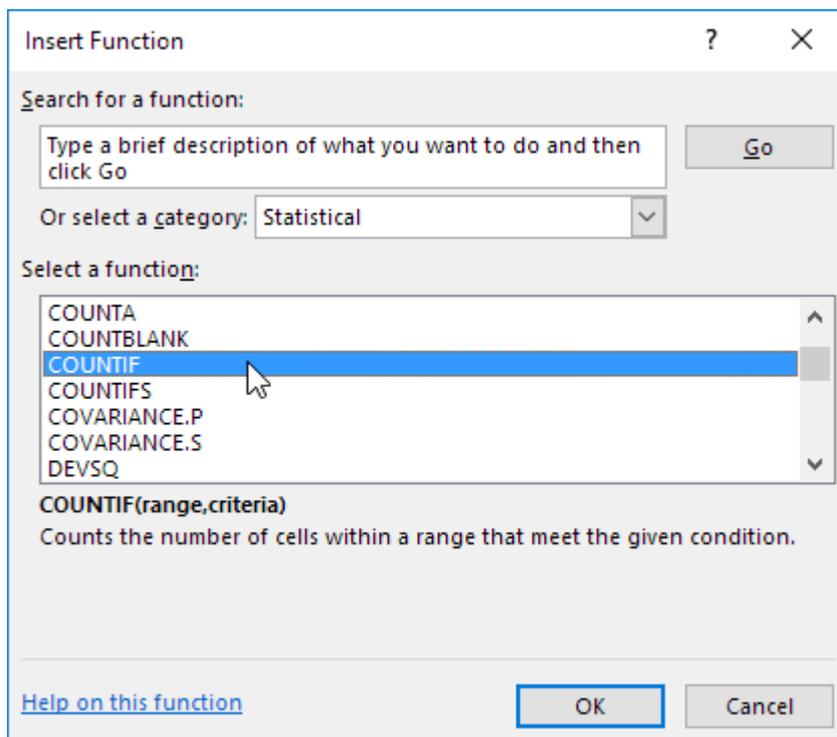
To insert a function, execute the following steps.

1. Select a cell.
2. Click the Insert Function button.



The 'Insert Function' dialog box appears.

3. Search for a function or select a function from a category. For example, choose COUNTIF from the Statistical category.

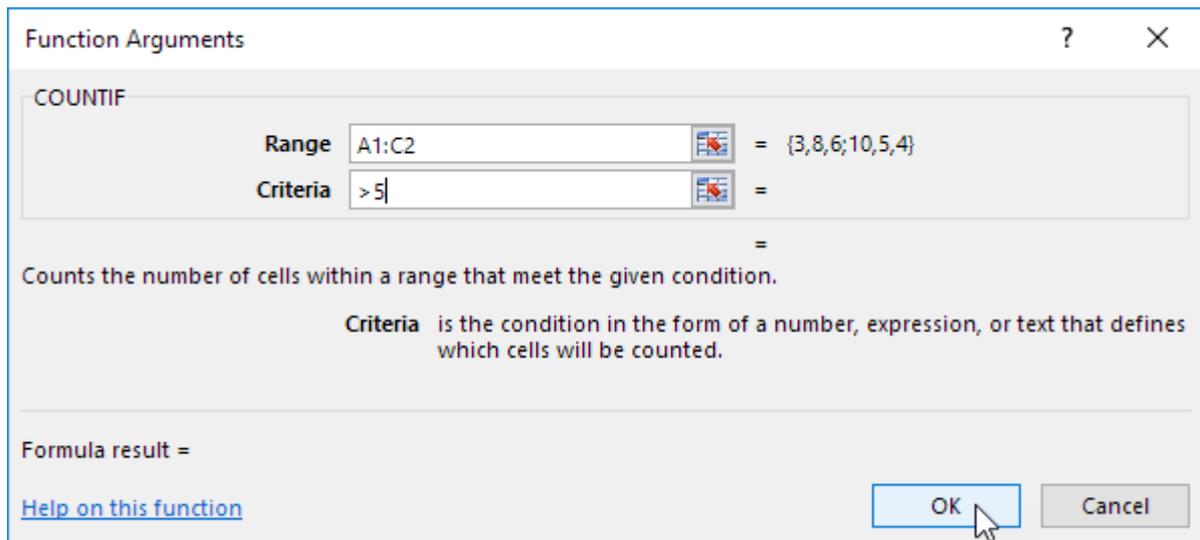


4. Click OK.

The 'Function Arguments' dialog box appears.

5. Click in the Range box and select the range A1:C2.
6. Click in the Criteria box and type >5.

7. Click OK.



Result. Excel counts the number of cells that are higher than 5.

	A	B	C	D	E	F
1	3	8	6	3		
2	10	5	4			
3						

Note: instead of using the Insert Function feature, simply type =COUNTIF(A1:C2,">5"). When you arrive at: =COUNTIF(instead of typing A1:C2, simply select the range A1:C2.