

Excel 2003: Simple Formulas and Functions

Formulas

Examples of formulas:

=34567^2

=A1 + B5

=SUM(C7:W7)

=SQRT(8+1)

To create a formula, first select the cell where you want the result. Type = in the formula bar to let Excel know that a formula is coming. Type in operators and values. You can use cell or range references which are column first, then row. Press the Enter key.

To switch back and forth between the formulas and the resulting values, use **CTRL+** (‘‘accent mark’’ key above Tab key). If the formula view is shown, it can be printed out in that condition.

Here are the references that can be used in a formula.

To refer to	Use
The cell in column A and row 10	A10
The range of cells in column A and rows 10 through 20	A10:A20
The range of cells in row 15 and columns B through E	B15:E15
All cells in row 5	5:5
All cells in rows 5 through 10	5:10
All cells in column H	H:H
All cells in columns H through J	H:J
The range of cells in columns A through E and rows 10 through 20	A10:E20

Here are the operators that can be used in a formula.

: (colon)	Reference of range between 2 cells
(single space)	Reference of 1 cell at intersection of 2 ranges
+ (plus sign)	Addition
- (minus sign)	Subtraction
* (asterisk)	Multiplication
/ (slash)	Division
&	Connects 2 strings of text
, (comma)	Combines multiple separate ranges into 1 reference
() (parentheses)	Calculations within parentheses are performed first.
% (percent)	Converts the number into a percentage.
^ (caret)	Exponential
= <> <= >= < >	Comparison

When more than one operator appears in a formula, it is calculated using the standard mathematical order of precedence. This order determines which operations are carried out first.

This is the order: () parentheses, ^ exponentiation, * multiplication and / division, + addition and - subtraction.

If multiplication and division, or addition and subtraction, appear in the same formula and there are no parentheses, they are evaluated from left to right as they appear in the formula.

Absolute and Relative cell references

If you want to refer to a cell in a formula, you will need to know the cell's location, or reference. If you copy a formula to a different location, the formula will change in reference to the original formula.

If you don't want any or all of the original formula to change when the formula is moved to a new location, you must use \$ (dollar signs) in front of the row and/or column reference.

If you are copying a formula from D 7 to H 9, depending on the dollar signs, this is the formula you will see in H 9.

<u>Value of:</u>	<u>Changes to:</u>
\$D\$7 (absolute column and absolute row)	\$D\$7
D\$7 (relative column and absolute row)	H\$7
\$D7 (absolute column and relative row)	\$D9
D7 (relative column and relative row)	H9

Concatenation

Using an ampersand to join separate pieces of text together to create a new string.

Cell A1 contains Last Name. Cell B1 contains First Name.

To combine them in a single cell, the formula is:

=A1&" " &B1 and shows as Last Name, First Name


Or =B1&" "&A1 shows as First Name Last Name

If you want the new information to stay permanently in the new location, even if changes are made to the original cells, you can change the value to the actual words instead of a formula.

- Select the cells where you want the values changed.
- Use **Edit>Copy**.
- Use **Edit>Paste Special** and choose **Values**. Click **OK**.

AutoSum

After selecting a range of cells and clicking the AutoSum button, the calculation required to arrive at the sum is automatically entered into a nearby cell. You can also choose a cell and click the AutoSum button. If the AutoSum function guesses the wrong cells you want added, you can correct it by selecting different cells.

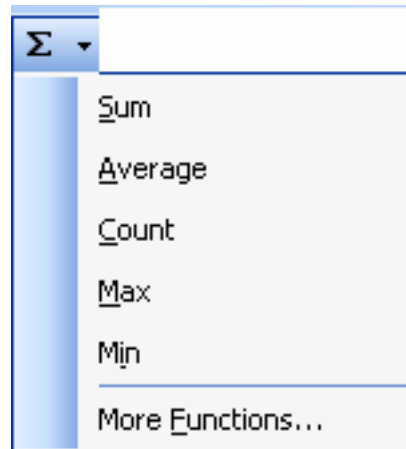
- Select a range of cells.
 - Click the AutoSum button.  The total value shows up in a nearby cell.
- Or
- Place the cursor in a cell near a range of numbers.
 - Click on the AutoSum button.

- If the AutoSum function is incorrect, go to the correct cells.
- Hold down the left mouse button to drag and select the correct range.

You can also click on the dropdown arrow next to this button to automatically perform more calculations.

You can automatically calculate the Sum, Average, Count, Max, and Min.

Clicking on “More Functions” will get you to the “Insert Function” dialog box.




Using Functions in Formulas

This is sometimes faster than typing up every mathematical step. A function is a preset formula that performs calculations using specific values (arguments) in a specific order (syntax). For example, using the AVERAGE function will show an equation like this:

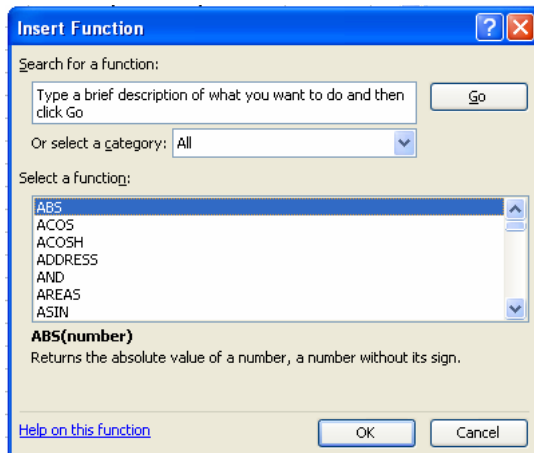
=AVERAGE(A10:E10)

The syntax of a formula using a function begins with an equal sign and then the function’s name. It is followed by an opening parenthesis, the arguments for the function separated by commas, and a closing parenthesis. In this case, the only argument was the location of the data to be added. This is all enclosed in parenthesis, since the function needs all the argument information in order to come up with an answer.

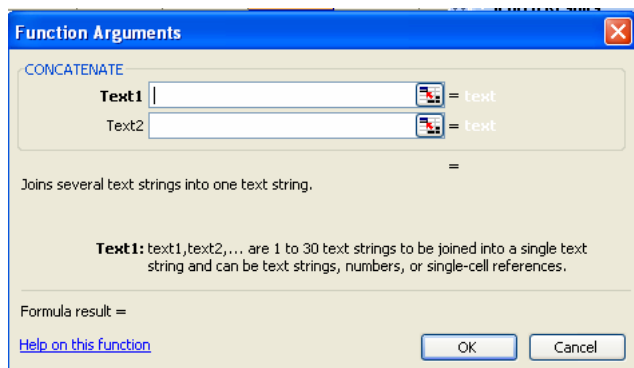
Arguments can be numbers, text, cells, ranges, formulas, other functions, or other needed information. The number of arguments you need will depend on the information needed to solve the equation or to show an answer.

To use a Function in a formula, **click** on the **Insert Function** button  to the left of the Formula Bar. You will see functions available to you.

To see the entire list, **click** on the box next to “Or select a category:” and **choose All**. Scroll along the “Select a function:” box to see the one you want. If you click on a function, you will see an explanation below.



Once you click **OK**, the Function Arguments dialog box will show up to assist you.



At that time you can enter specific numbers or cells or ranges where the information is kept. Click **OK** to enter the formula into the original cell.

AutoFill

If you plan to use the same relative formula across several columns or rows, type the beginning formula for the list. Click back into that cell.

Hold down the left mouse button at the lower right corner of the cell. You will see a black cross mark. Drag across or down to automatically finish filling in the cells.

From

Sales Rep	Jan	Feb
Blue, J.	124	209.69
Brown, N.	170.38	109.01
Green, T.	419.26	215.19
Black, R.	148.44	125.56
Totals	862.08	

to

Sales Rep	Jan	Feb
Blue, J.	124	209.69
Brown, N.	170.38	109.01
Green, T.	419.26	215.19
Black, R.	148.44	125.56
Totals	862.08	

to

Sales Rep	Jan	Feb
Blue, J.	124	209.69
Brown, N.	170.38	109.01
Green, T.	419.26	215.19
Black, R.	148.44	125.56
Totals	862.08	659.45

Creating 3-D Formulas

In a 3-D formula, information from more than one worksheet can be combined. In the formula, the worksheet names are separated from the cells by an exclamation point. For example, a formula that adds totals in cell location B10 from 4 different quarters worksheets might look like this:
=Qtr 1!B10+Qtr 2!B10+Qtr 3!B10+Qtr 4!B10

To create a 3-D formula, first **select the cell** where you want the result. **Type = in the formula bar** to let Excel know that a formula is coming. **Select the worksheet and the cell** where the information is located. Type the **mathematical operator**. **Select the next cell** in the next worksheet where you want information. Continue to **add mathematical operators and cell locations** until the formula is complete. Press the **Enter** key when you are done.

Copying Formulas Between Worksheets

To copy formulas, first select the worksheet and range that contains the formulas you want. Use **Edit>Copy** or the **Copy** button. Go to the wanted worksheet and the upper left cell of the new range. Use **Edit>Paste Special**. Select **Formulas** and click the **OK** button.

Linking to Another Cell

You can have one cell continuously showing a value from another cell. This is also called “creating a reference between cells” if the original cell is used in a formula. The final cell might look like this:

=’Worksheet 2’D6

Click on the reference cell or range.

Use **Edit>Copy**.

Go to the destination worksheet.

Use **Edit>Paste Special**.

Click on the **Paste Link** button.



When the original value is updated, the information will show up in the final result cell.