Microsoft Excel 2010: 
Create or Delete a Formula

Formulas are equations that perform calculations on values in your worksheet. A formula always starts with an equal sign (=).

You can create a simple formula by using constants and calculation operators. For example, the formula 
\[ =5+2\times3 \]
multiplies two numbers and then adds a number to the result. Microsoft Office Excel follows the standard order of mathematical operations. In the preceding example, the multiplication operation \((2\times3)\) is performed first, and then 5 is added to its result.

You can also create a formula by using a function. For example, the formulas =SUM(A1:A2) and SUM(A1,A2) both use the SUM function to add the values in cells A1 and A2.

Depending on the type of formula that you create, a formula can contain any or all of the following parts.

1 **Functions** A function, such as PI(), starts with an equal sign (=). For many functions, such as SUM(), you can enter arguments within its parentheses. Each function has a specific argument syntax. Some arguments require exactly one argument, others require or allow several arguments (that is, some arguments might be optional), and some other functions allow no arguments at all — such as PI().

2 **Cell references** You can refer to data in worksheet cells by including cell references in the formula. For example, the cell reference A2 returns the value of that cell or uses that value in the calculation.

3 **Constants** You can also enter constants, such as numbers (such as 2) or text values, directly into a formula.

4 **Operators** Operators are the symbols that are used to specify the type of calculation that you want the formula to perform. For example, the ^ (caret) operator raises a number to a power, and the * (asterisk) operator multiplies numbers.

To achieve the calculation result that you want, you can use a single function, nested functions, or arrays that calculate single or multiple results.
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Create a simple formula by using constants and calculation operators

1. Click the cell in which you want to enter the formula.
2. Type = (equal sign).
3. To enter the formula, do one of the following:
   - Type the constants and operators that you want to use in the calculation.
     
     | EXAMPLE FORMULA | WHAT IT DOES               |
     |-----------------|---------------------------|
     | =5+2            | Adds 5 and 2              |
     | =5-2            | Subtracts 2 from 5        |
     | =5/2            | Divides 5 by 2            |
     | =5*2            | Multiplies 5 times 2      |
     | =5^2            | Raises 5 to the 2nd power |
   - Click the cell that contains the value that you want to use in the formula, type the operator that you want to use, and then click another cell that contains a value.
     
     | EXAMPLE FORMULA | WHAT IT DOES               |
     |-----------------|---------------------------|
     | =A1+A2          | Adds the values in cells A1 and A2 |
     | =A1-A2          | Subtracts the value in cell A2 from the value in A1 |
     | =A1/A2          | Divides the value in cell A1 by the value in A2 |
     | =A1*A2          | Multiplies the value in cell A1 times the value in A2 |
     | =A1^A2          | Raises the value in cell A1 to the exponential value specified in A2 |

TIP   You can enter as many constants and operators in a formula as you need, up to 8192 characters, to achieve the calculation result that you want.

4. Press ENTER.

Create a formula by using cell references and names

The example formulas at the end of this section contain relative references to and names of other cells. The cell that contains the formula is known as a dependent cell when its value depends on the values in other cells. For example, cell B2 is a dependent cell if it contains the formula =C2.

1. Click the cell in which you want to enter the formula.
2. In the formula bar, type = (equal sign).
3. Do one of the following:
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- To create a reference, select a cell, a range of cells, a location in another worksheet, or a location in another workbook. This behavior is called semi-selection. You can drag the border of the cell selection to move the selection, or drag the corner of the border to expand the selection.

1 The first cell reference is B3, the color is blue, and the cell range has a blue border with square corners.
2 The second cell reference is C3, the color is green, and the cell range has a green border with square corners.

NOTE If there is no square corner on a color-coded border, the reference is to a named range.

- To enter a reference to a named range, press F3, select the name in the Paste name box, and click OK.

<table>
<thead>
<tr>
<th>EXAMPLE FORMULA</th>
<th>WHAT IT DOES</th>
</tr>
</thead>
<tbody>
<tr>
<td>=C2</td>
<td>Uses the value in cell C2</td>
</tr>
<tr>
<td>=Sheet2!B2</td>
<td>Uses the value in cell B2 on Sheet2</td>
</tr>
<tr>
<td>=Asset-Liability</td>
<td>Subtracts the value in a cell named Liability from the value in a cell named Asset</td>
</tr>
</tbody>
</table>

4. Press ENTER.

Create a formula by using a function

1. Click the cell in which you want to enter the formula.
2. To start the formula with the function, click **Insert Function** on the formula bar.
   Excel inserts the equal sign (=) for you.
3. Select the function that you want to use.
Microsoft Excel 2010: 
Create or Delete a Formula

If you’re not sure which function to use, you can type a question that describes what you want 
to do in the Search for a function box (for example, “add numbers” returns the SUM function), 
or browse from the categories in the Or Select a category box.

4. Enter the arguments.

TIP To enter cell references as an argument, click Collapse Dialog (which temporarily 
hides the dialog box), select the cells on the worksheet, and then press Expand Dialog.

5. After you complete the formula, press ENTER.

TIP To summarize values quickly, you can also use AutoSum. On the Home tab, in the Editing group, 
click AutoSum, and then click the function that you want.

Create a formula by using nested functions

Nested functions use a function as one of the arguments of another function. You can nest up to 64 
levels of functions. The following formula sums a set of numbers (G2:G5) only if the average of another 
set of numbers (F2:F5) is greater than 50. Otherwise, it returns 0.

EXAMPLE FORMULA | WHAT IT DOES
--- | ---
=SUM(A:A) | Adds all numbers in column A
=AVERAGE(A1:B4) | Averages all numbers in the range

After you complete the formula, press ENTER.

TIP To summarize values quickly, you can also use AutoSum. On the Home tab, in the Editing group, 
click AutoSum, and then click the function that you want.
Microsoft Excel 2010:
Create or Delete a Formula

4. To enter the arguments, do one or more of the following:
   - To enter cell references as an argument, click **Collapse Dialog** next to the argument you want (which temporarily hides the dialog box), select the cells on the worksheet, and then press **Expand Dialog**.
   - To enter another function as an argument, enter the function in the argument box that you want. For example, you can add `SUM(G2:G5)` in the **Value_if_true** edit box of the **IF** function.
   - The parts of the formula displayed in the **Function Arguments** dialog box reflect the function that you selected in the previous step. For example, if you clicked **IF**, the **Function arguments** dialog box displays the arguments for the **IF** function.

Create an array formula that calculates a single result

You can use an array formula to perform several calculations to generate a single result. This type of array formula can simplify a worksheet model by replacing several different formulas with a single array formula.

1. Click the cell in which you want to enter the array formula.
2. Enter the formula that you want to use.

   **TIP** Array formulas use standard formula syntax. They all begin with an equal sign, and you can use any of the built-in Excel functions in your array formulas.

   For example, the following formula calculates the total value of an array of stock prices and shares, without using a row of cells to calculate and display the total values for each stock.

   ![Array formula example](image)

   **Array formula that produces a single result**

   When you enter the formula `{=SUM(B2:C2*B3:C3)}` as an array formula, Excel multiplies the number of shares by the price for each stock (500*10 and 300*15), and then adds the results of those calculations together to get a total value of 9500.

3. Press **CTRL+SHIFT+ENTER**.

   Excel automatically inserts the formula between `{ }` (a pair of opening and closing braces).

   **NOTE** Manually typing braces around a formula will not convert it into an array formula — you must press **CTRL+SHIFT+ENTER** to create an array formula.
Microsoft Excel 2010:
Create or Delete a Formula

IMPORTANT Any time you edit the array formula, the braces ({ }) disappear from the array formula, and you must press CTRL+SHIFT+ENTER again to incorporate the changes into an array formula and to add the braces.

Create an array formula that calculates multiple results

Some worksheet functions return arrays of values, or require an array of values as an argument. To calculate multiple results by using an array formula, you must enter the array into a range of cells that has the same number of rows and columns as the array arguments have.

1. Select the range of cells in which you want to enter the array formula.
2. Enter the formula that you want to use.
   
   TIP Array formulas use standard formula syntax. They all begin with an equal sign, and you can use any of the built-in Excel functions in your array formulas.

   For example, given a series of three sales figures (column B) for a series of three months (column A), the TREND function determines the straight-line values for the sales figures. To display all the results of the formula, it is entered into three cells in column C (C1:C3).

   ![Array formula that produces multiple results]

   Array formula that produces multiple results

   When you enter the formula =TREND(B1:B3,A1:A3) as an array formula, it produces three separate results (22196, 17079, and 11962), based on the three sales figures and the three months.

3. Press CTRL+SHIFT+ENTER.
   Excel automatically inserts the formula between { } (a pair of opening and closing braces).

   NOTE Manually typing braces around a formula will not convert it into an array formula — you must press CTRL+SHIFT+ENTER to create an array formula.

IMPORTANT Any time you edit the array formula, the braces ({ }) disappear from the array formula, and you must press CTRL+SHIFT+ENTER again to incorporate the changes into an array formula and to add the braces.

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Delete a formula

When you delete a formula, the resulting values of the formula are also deleted. However, you can instead remove the formula only and leave the resulting value of the formula displayed in the cell.

- To delete formulas along with their resulting values, do the following:
  1. Select the cell or range of cells that contains the formula.
  2. Press DELETE.

- To delete formulas without removing their resulting values, do the following:
  1. Select the cell or range of cells that contains the formula.

    If the formula is an array formula, select the range of cells that contains the array formula.

    1. Click a cell in the array formula.
    2. On the Home tab, in the Editing group, click Find & Select, and then click Go To.
    3. Click Special.
    4. Click Current array.

    2. On the Home tab, in the Clipboard group, click Copy.

    Keyboard shortcut You can also press CTRL+C.

    3. On the Home tab, in the Clipboard group, click the arrow below Paste, and then click Paste Values.

Learn tips and tricks about creating formulas

Easily change the type of reference To switch between relative, absolute, and mixed references:

  1. Select the cell that contains the formula.
  2. In the formula bar, select the reference that you want to change.
  3. Press F4 to switch between the reference types.

Quickly copy formulas You can quickly enter the same formula into a range of cells. Select the range that you want to calculate, type the formula, and then press CTRL+ENTER. For example, if you type =SUM(A1:B1) in range C1:C5, and then press CTRL+ENTER, Excel enters the formula in each cell of the range, using A1 as a relative reference.
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Use Formula Autocomplete  To make it easier to create and edit formulas and minimize typing and syntax errors, use Formula Autocomplete. After you type an = (equal sign) and beginning letters (the beginning letters act as a display trigger), Excel displays a dynamic list of valid functions and names below the cell. After you insert the function or name into the formula by using an insert trigger (pressing TAB or double-clicking the item in the list), Excel displays any appropriate arguments. As you fill out the formula, typing a comma can also act as a display trigger — Excel may display additional arguments. You can insert additional functions or names into your formula and, as you type their beginning letters, Excel again displays a dynamic list from which you can choose.

Use Function ScreenTips  If you are familiar with the arguments of a function, you can use the function ScreenTip that appears after you type the function name and an opening parenthesis. Click the function name to view the Help topic on the function, or click an argument name to select the corresponding argument in your formula.

Avoid common errors when creating formulas

The following table summarizes some of the most common errors that you can make when entering a formula and how to correct those errors:

<table>
<thead>
<tr>
<th>MAKE SURE THAT YOU...</th>
<th>MORE INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Match all open and close parentheses</td>
<td>Make sure that all parentheses are part of a matching pair. When you create a formula, Excel displays parentheses in color as they are entered.</td>
</tr>
<tr>
<td>Use a colon to indicate a range</td>
<td>When you refer to a range of cells, use a colon (:) to separate the reference to the first cell in the range and the reference to the last cell in the range. For example, A1:A5.</td>
</tr>
<tr>
<td>Enter all required arguments</td>
<td>Some functions have required arguments. Also, make sure that you have not entered too many arguments.</td>
</tr>
<tr>
<td>Nest no more than 64 functions</td>
<td>You can enter, or nest, no more than 64 levels of functions within a function.</td>
</tr>
<tr>
<td>Enclose other sheet names in single quotation marks</td>
<td>If the formula refers to values or cells on other worksheets or workbooks, and the name of the other workbook or worksheet contains a nonalphabetical character, you must enclose its name within single quotation marks (').</td>
</tr>
<tr>
<td>Include the path to external workbooks</td>
<td>Make sure that each external reference contains a workbook name and the path to the workbook.</td>
</tr>
<tr>
<td>Enter numbers without formatting</td>
<td>Do not format numbers as you enter them in formulas. For example, even if the value that you want to enter is $1,000, enter 1000 in the formula.</td>
</tr>
</tbody>
</table>