



# Overview of formulas in Excel

Chapter 2

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**Create a formula that refers  
to values in other cells**



# Create a formula that refers to values in other cells

1. Select a cell.

2. Type the equal sign =.

**Note:** Formulas in Excel always begin with the equal sign.

3. Select a cell or type its address in the selected cell.

	Jan
Sale	120
Overhead	100
Profit	=B2

4. Enter an operator. For example, – for subtraction.

5. Select the next cell, or type its address in the selected cell.

120
100
=B2-B3

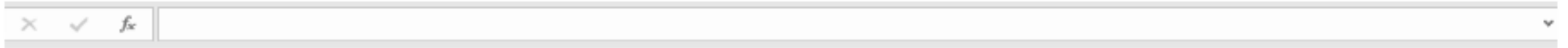
6. Press Enter. The result of the calculation appears in the cell with the formula.

**See a formula**



# See a formula

1. When a formula is entered into a cell, it also appears in the **Formula bar**.



2. To see a formula, select a cell, and it will appear in the formula bar.



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**Enter a formula that contains  
a built-in function**



# Enter a formula that contains a built-in function

1. Select an empty cell.
2. Type an equal sign = and then type a function. For example, =SUM for getting the total sales.
3. Type an opening parenthesis (.
4. Select the range of cells, and then type a closing parenthesis).

	Jan	Feb	Mar	Apr	May	Jun	Total
Sales	100	200	250	150	300	500	=SUM(B2:G2)

5. Press Enter to get the result.



**Download our Formulas  
tutorial workbook**



# Download our Formulas tutorial workbook

We've put together a [Get started with Formulas workbook](#) that you can download. If you're new to Excel, or even if you have some experience with it, you can walk through Excel's most common formulas in this tour. With real-world examples and helpful visuals, you'll be able to Sum, Count, Average, and Vlookup like a pro.

Source: <https://support.microsoft.com/en-us/excel>

**Formulas in-depth**



# The parts of an Excel formula

A formula can also contain any or all of the following: **functions**, **references**, **operators**, and **constants**.

## Parts of a formula

  
=PI() \* A2 ^ 2

1. **Functions:** The PI() function returns the value of pi: 3.142...
2. **References:** A2 returns the value in cell A2.
3. **Constants:** Numbers or text values entered directly into a formula, such as 2.
4. **Operators:** The ^ (caret) operator raises a number to a power, and the \* (asterisk) operator multiplies numbers.

Source: <https://support.microsoft.com/en-us/excel>

# Using constants in Excel formulas

A constant is a value that is not calculated; it always stays the same. For example, the date 10/9/2008, the number 210, and the text "Quarterly Earnings" are all constants. An expression or a value resulting from an expression is not a constant. If you use constants in a formula instead of references to cells (for example, =30+70+110), the result changes only if you modify the formula. In general, it's best to place constants in individual cells where they can be easily changed if needed, then reference those cells in formulas.

Source: <https://support.microsoft.com/en-us/excel>

# The A1 reference style

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

Source: <https://support.microsoft.com/en-us/excel>

# Making a reference to a cell or a range of cells on another worksheet in the same workbook

In the following example, the **AVERAGE** function calculates the average value for the range B1:B10 on the worksheet named Marketing in the same workbook.

  
=AVERAGE(Marketing!B1:B10)

1. Refers to the worksheet named Marketing
2. Refers to the range of cells from B1 to B10
3. The exclamation point (!) Separates the worksheet reference from the cell range reference

**Note:** If the referenced worksheet has spaces or numbers in it, then you need to add apostrophes (') before and after the worksheet name, like ='123'!A1 or ='January Revenue'!A1.

# The difference between absolute, relative and mixed references

- a. **Relative references** A relative cell reference in a formula, such as A1, is based on the relative position of the cell that contains the formula and the cell the reference refers to. If the position of the cell that contains the formula changes, the reference is changed. If you copy or fill the formula across rows or down columns, the reference automatically adjusts. By default, new formulas use relative references. For example, if you copy or fill a relative reference in cell B2 to cell B3, it automatically adjusts from =A1 to =A2.

## Copied formula with relative reference

	A	B
1	■	
2	■	=A1
3		=A2



# The difference between absolute, relative and mixed references (cont.)

- b. **Absolute references** An absolute cell reference in a formula, such as \$A\$1, always refer to a cell in a specific location. If the position of the cell that contains the formula changes, the absolute reference remains the same. If you copy or fill the formula across rows or down columns, the absolute reference does not adjust. By default, new formulas use relative references, so you may need to switch them to absolute references. For example, if you copy or fill an absolute reference in cell B2 to cell B3, it stays the same in both cells: =\$A\$1.

## Copied formula with absolute reference

	A	B
1	█	
2		=\$A\$1
3		=\$A\$1

# The difference between absolute, relative and mixed references (cont.)

- c. **Mixed references** A mixed reference has either an absolute column and relative row, or absolute row and relative column. An absolute column reference takes the form \$A1, \$B1, and so on. An absolute row reference takes the form A\$1, B\$1, and so on. If the position of the cell that contains the formula changes, the relative reference is changed, and the absolute reference does not change. If you copy or fill the formula across rows or down columns, the relative reference automatically adjusts, and the absolute reference does not adjust. For example, if you copy or fill a mixed reference from cell A2 to B3, it adjusts from =A\$1 to =B\$1.

## Copied formula with mixed reference

	A	B	C
1	█	█	
2		=A\$1	
3			=B\$1

# The 3-D reference style

**Conveniently referencing multiple worksheets** If you want to analyze data in the same cell or range of cells on multiple worksheets within a workbook, use a 3-D reference. A 3-D reference includes the cell or range reference, preceded by a range of worksheet names. Excel uses any worksheets stored between the starting and ending names of the reference. For example, =SUM(Sheet2:Sheet13!B5) adds all the values contained in cell B5 on all the worksheets between and including Sheet 2 and Sheet 13.

- You can use 3-D references to refer to cells on other sheets, to define names, and to create formulas by using the following functions: SUM, AVERAGE, AVERAGEA, COUNT, COUNTA, MAX, MAXA, MIN, MINA, PRODUCT, STDEV.P, STDEV.S, STDEVA, STDEVPA, VAR.P, VAR.S, VARA, and VARPA.
- 3-D references cannot be used in array formulas.
- 3-D references cannot be used with the intersection operator (a single space) or in formulas that use implicit intersection.

# The 3-D reference style (cont.)

**What occurs when you move, copy, insert, or delete worksheets** The following examples explain what happens when you move, copy, insert, or delete worksheets that are included in a 3-D reference. The examples use the formula =SUM(Sheet2:Sheet6!A2:A5) to add cells A2 through A5 on worksheets 2 through 6.

- **Insert or copy** If you insert or copy sheets between Sheet2 and Sheet6 (the endpoints in this example), Excel includes all values in cells A2 through A5 from the added sheets in the calculations.
- **Delete** If you delete sheets between Sheet2 and Sheet6, Excel removes their values from the calculation.
- **Move** If you move sheets from between Sheet2 and Sheet6 to a location outside the referenced sheet range, Excel removes their values from the calculation.
- **Move an endpoint** If you move Sheet2 or Sheet6 to another location in the same workbook, Excel adjusts the calculation to accommodate the new range of sheets between them.
- **Delete an endpoint** If you delete Sheet2 or Sheet6, Excel adjusts the calculation to accommodate the range of sheets between them.

# The R1C1 reference style

Reference	Meaning
R[-2]C	A relative reference to the cell two rows up and in the same column
R[2]C[2]	A relative reference to the cell two rows down and two columns to the right
R2C2	An absolute reference to the cell in the second row and in the second column
R[-1]	A relative reference to the entire row above the active cell
R	An absolute reference to the current row

Source: <https://support.microsoft.com/en-us/excel>

**Thank you**