

Building Reliable Excel Formulas and Calculations

Formulas are the engine behind every useful Excel spreadsheet. This chapter covers how to build basic formulas from scratch, use AutoSum effectively, understand the relationship between formulas and formatting, and avoid common mistakes that lead to incorrect results. You'll also see how Excel can function as a quick calculator for on-the-fly computations. For accountants and tax professionals, getting formulas right the first time is critical, and this chapter equips you with the knowledge to do exactly that.

CREDIT HOURS 2 | FIELD OF STUDY BUSINESS | EXAM QUESTIONS 10

[Start Course ↓](#)[Final Exam Copy ↓](#)

LEARNING ASSIGNMENTS AND OBJECTIVES

Assignment

- Study the full course materials included here.
- Complete the review questions after each chapter.
- Answer 10 final exam questions.
- Final exam is scored immediately, 70% or better passes.
- Certificate of completion is available in your account.
- Failed exams can be retaken free of charge.

Course Objectives

- Identify how to use operators when creating formulas.

Copyright Notice

© 2026 Pacific CPE, LP. All rights reserved.

The materials in this course — including the text, illustrations, exhibits, examples, exam questions, and review questions — are the copyrighted property of Pacific CPE, LP. No portion of this course may be reproduced, stored in a retrieval system, distributed, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise) without the prior written permission of Pacific CPE, LP, except for the personal, non-commercial use of the registered learner.

Pacific CPE, LP grants the registered learner a single-seat, non-transferable license to access this course for the purpose of completing the associated continuing professional education credit. Account credentials may not be shared. Group access requires a separate enterprise license.

This course is provided "as is" for educational purposes. While Pacific CPE, LP makes a reasonable effort to ensure the content is current and accurate, the materials should not be relied upon as a substitute for professional advice. Pacific CPE, LP disclaims all liability for any error, omission, or loss arising from the use of, or reliance on, the course content.

Questions about reproduction, licensing, or use of these materials should be directed to support@pacificcpe.com.

Publication Date: June 2026

TABLE OF CONTENTS

CHAPTER	Building Basic Formulas.....	4
01		
1.01	Formulas And Formatting.....	7
1.02	Using Excel Like A Handheld Calculator.....	8
1.03	When Autosum Doesn'T Sum.....	10
	Test Your Knowledge.....	50
	Final Exam Copy.....	57
	Glossary.....	55
	Index	

Chapter 1: BUILDING BASIC FORMULAS

Chapter Objective

After completing this chapter, you should be able to:

- Identify how to use operators when creating formulas.

You can, if you want, use Excel only to store data. By using the tables, you can turn Excel into a competent database management system. Nothing wrong with that. However, using Excel only to store data is kind of like having a bicycle and only walking with it everywhere you go: You're missing the best part!

What part of Excel are you missing if you only use the program to store data? One word: *formulas*, which are, hands down, Excel's most powerful and most useful feature. Formulas enable you to take the static, lifeless data you've stored in a worksheet and animate that data to return answers and analyses and generate insights and information. Whether you want to add a few cells together, find the average value in a range, or calculate the tax on an invoice, Excel formulas can get the job done.

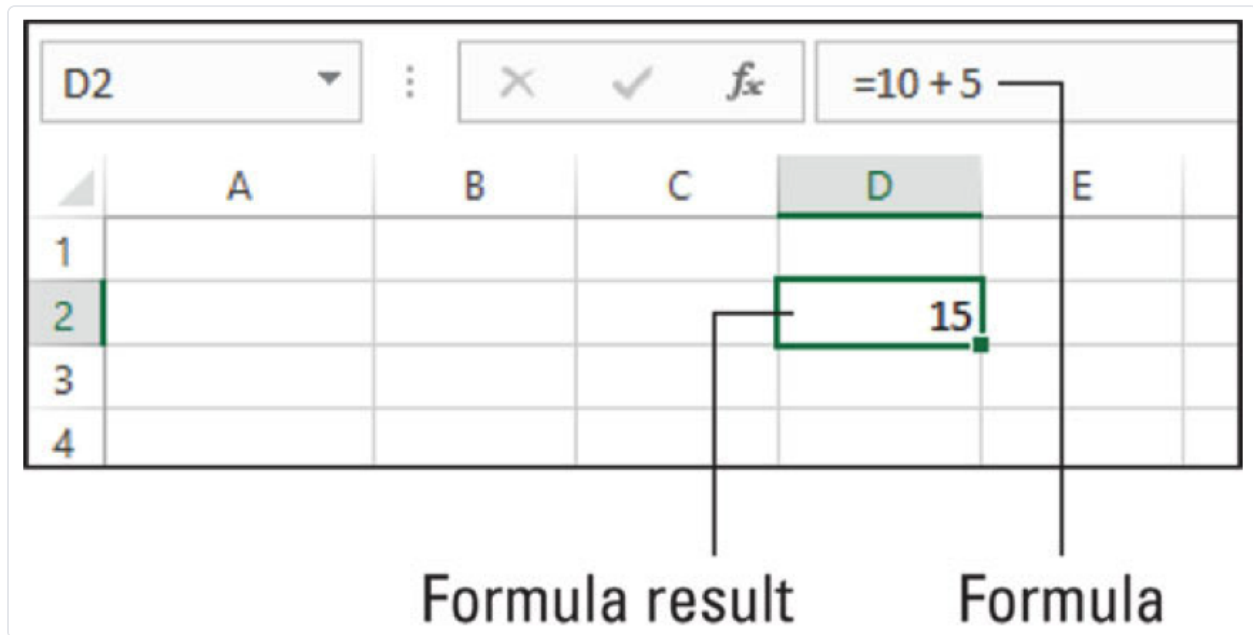
So, I hear you thinking, if Excel formulas are so powerful, they must be hideously complex, right? Well, I'm not going to lie to you: Advanced Excel formulas make the Dead Sea Scrolls look like a first-grade reader. That's the bad news. The oh-so-good news is that most Excel formulas are much simpler and very straightforward and learning how to build these basic formulas doesn't require a graduate degree in math or finance. Are you pumped to learn Excel's most exciting feature? I knew it!

GETTING STARTED WITH FORMULAS

A formula is a special type of cell entry that performs a calculation. When you complete the cell entry, two things happen, as demonstrated in Figure 8-1:

- The formula result appears in the cell.
- When you select the cell, the formula itself appears in the Formula bar.

FIGURE 8-1: THE FORMULA RESULT APPEARS IN THE CELL, WHILE THE FORMULA ITSELF APPEARS IN THE FORMULA BAR.



Here's the formula shown in the Figure 8-1 example:

`=10 + 5`

What's going on here? This formula just adds the number 10 and the number 5, resulting in the value 15 that appears in cell D2 of Figure 8-1. Happily, even this simple formula demonstrates pretty much everything you need to know to get started with Excel formulas. That is, it demonstrates the equal sign (=), operands, and operators:

- **Equal sign (=):** All Excel formulas—from the simple addition formula shown in Figure 8-1 to the most complex statistical calculation—begin with the equal sign (=). This symbol says to Excel, “Hey, everything that follows is a formula, okay?”
- **Operands:** An operand provides a bit of data for the formula to work with. In the formula used in Figure 8-1, the operands are the numbers 10 and 5. Operands can be raw data values (which are called constants), function results (I talk about functions a bit later; see “Augmenting Formulas with Worksheet Functions”), or cell or range addresses. If you enter a cell address in a formula, Excel uses the current value of that cell in your formula. For example, Figure 8-2 shows an updated version of the example formula from Figure 8-1. This time, the value 10 is stored in cell D1 and the value 5 is stored in cell E1, so here's the updated formula (visible in the Formula bar):

`=D1 + E1`

Remember

The advantage of using cell range addresses instead of constants in formulas is that when you use cell addresses, Excel automatically updates the formula result whenever you change the values in the cells.

• **Operators:** An operator is a special symbol that tells Excel what to do with the operands.

As demonstrated in Figure 8-1 and 8-2, the addition (+) operator tells Excel to add the two operands. Other common operators are subtraction (-), multiplication (*), and division (/).

FIGURE 8-2: YOU CAN USE CELL ADDRESSES AS FORMULA OPERANDS.

So, when you create a formula, you perform these general steps:

1. Select the cell where you want the formula to appear.
2. Type the equal sign (=) to alert Excel that you're building a formula.
3. Type the first operand, such as a constant, function, cell address, or range coordinates.
4. Type an operator.
5. Type the next operand.
6. Repeat Steps 4 and 5 until your formula is done.
7. Complete the cell entry by clicking the Enter button, pressing Enter, or pressing an arrow key.

Pointing at formula cells

When building your formulas, when you get to a point in the formula where you want to use a cell address as an operand, you can either type the cell address or you can click the cell in the worksheet. Clicking the cell is called pointing at the cell and what happens is that Excel inserts the cell address into your formula. (Pointing also works for range operands, where in this case you click and drag over the range you want to use in your formula.)

Using the pointing method to supply a cell address for a formula is often easier and is always a much more foolproof method than entering the cell address by hand. The problem with typing a cell address is that it's all-too easy to type the incorrect row number or column letter (or both), so now your formula is referencing the wrong cell. By contrast, when you click the cell directly, Excel always enters the correct address (assuming you clicked the correct cell!).

Therefore, stick to pointing when building your formulas and restrict typing cell addresses to the odd occasion when you need to enter or edit a cell address and pointing to it is either not practical or just too much trouble.

Warning

As with the other types of cell entries, you must take some action to complete a formula and enter it into the current cell (such as clicking the Enter button on the Formula bar, pressing the Enter key, or pressing an arrow key). Unlike when entering numeric or text entries, however, you want to stay clear of clicking another cell to complete the data entry. This is because, when you click a cell when building or editing a formula on the Formula bar, more often than not, you end up not only selecting the new cell, but also adding its address to the otherwise complete formula.

Formulas and Formatting**Technical Stuff**

When defining a formula that uses operators or functions, Excel picks up the number formatting of the cells that are referenced in the formula. For example, if you add cell A2 to B3, as in `=A2+B3`, and cell B3 is formatted with the Currency Style format, the result will inherit this format and be displayed in its cell using the Currency Style.

As soon as you complete a formula entry, Excel calculates the result, which then displays it inside the cell within the worksheet. (The contents of the formula, however, continue to be visible on the Formula bar anytime the cell is active.) If you make an error in the formula that prevents Excel from being able to calculate the formula at all, Excel displays an Alert dialog box suggesting how to fix the problem. If, however, you make an error that prevents Excel from being able to display a proper result when it calculates the formula, the program displays an Error value rather than the expected computed value.

Editing formulas

As with numeric and text entries, you can edit the contents of formulas either in their cells or on the Formula bar. To edit a formula in its cell, double-click the cell or press F2 to position the insertion point in that cell. (Double-clicking the cell positions the insertion point in the middle of the formula, whereas pressing F2 positions it at the end of the formula — you can also double-click at the beginning or end of the cell to position the insertion point there.) To edit a formula on the Formula bar, use the I-beam mouse to position the insertion point at the place in the formula that needs editing first.

As soon as you put the Excel program into Edit mode, Excel displays each of the cell references in the formula within the cell in a different color and uses each color to outline the corresponding cell or cell range in the worksheet. This coloration enables you to quickly identify the cells and their

values that are referred to in your formula and, if necessary, modify them as well. You can use any of the four sizing handles that appear around the cell or cell range to modify the cell selection in the worksheet and consequently update the cell references in the formula.

Using Excel Like a Handheld Calculator

Tip

Sometimes, you may need to calculate the number that you need to input in a cell as a constant. Instead of reaching for your smartphone Calculator app to compute the needed value and then manually entering it into a cell of your worksheet, you can set up a formula in the cell that returns the number that you need to input and then convert the formula into a constant value. You convert the formula into a constant by pressing F2 to edit the cell, immediately pressing F9 to recalculate the formula and display the result on the Formula bar, and then clicking the Enter button on the Formula bar or pressing the Enter key to input the calculated result into the cell (as though you had manually input the result in the cell).

Using AutoSum to add numbers

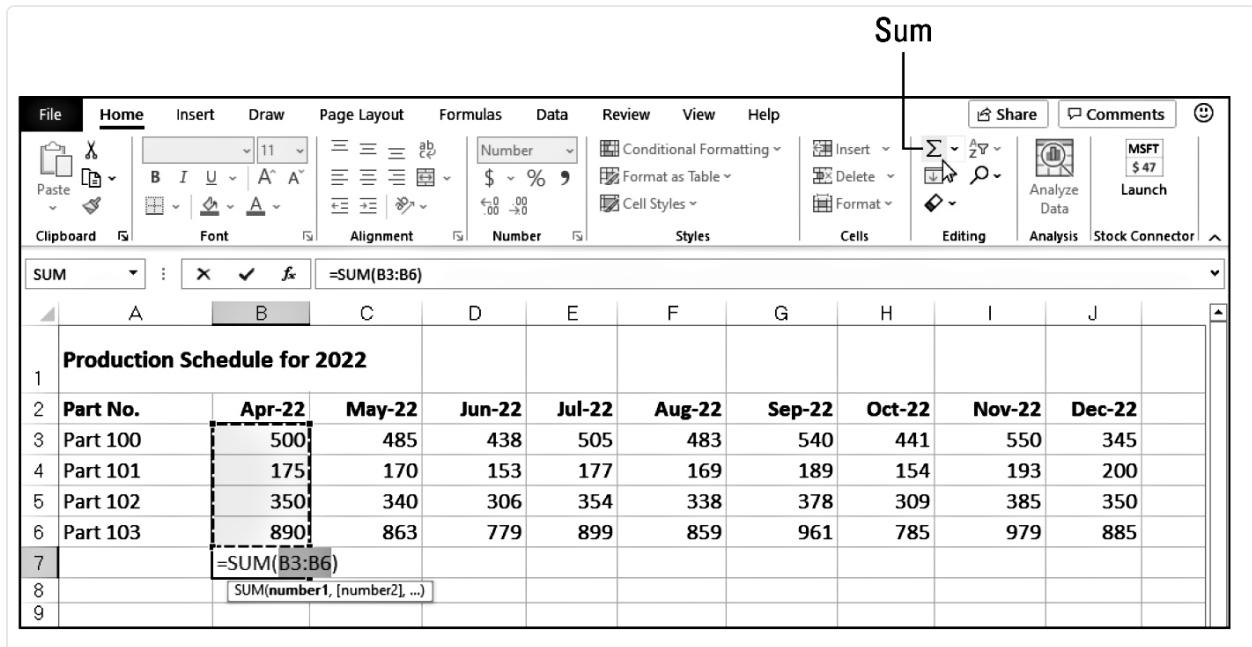
The easiest and often the most used formula that you will create is the one that totals rows and columns of numbers in your worksheet. Usually, to total a row or column of numbers, you can click the Sum command button (the one with the Σ on it) on the Ribbon's Home tab, in the Editing group. When you click Sum, Excel inserts the built-in SUM function into the active cell and simultaneously selects what the program thinks is the most likely range of numbers that you want summed.

Tip

Instead of taking the time to click the Sum button on the Home tab, it's often faster and easier to press Alt+= (equal sign) to insert the SUM function in the current cell and have Excel select the range of cells most likely to be totaled.

Figure 8-3 (sample workbook: Production Schedule 2022.xlsx) demonstrates how this works. For this figure, I positioned the cell cursor in cell B7, which is the first cell where I need to build a formula that totals the various parts produced in April. I then clicked the Sum button (pointed out in Figure 8-3) on the Ribbon's Home tab.

FIGURE 8-3: USING AUTOSUM TO CREATE A SUM FORMULA THAT TOTALS A COLUMN OF NUMBERS. (SAMPLE WORKBOOK: PRODUCTION SCHEDULE 2022.XLSX)



As Figure 8-3 shows, Excel inserts an equal sign followed by the SUM function and correctly suggested the cell range B3:B6 as the argument to this function (that is, the range to be summed). Because Excel correctly selected the range to be summed (leaving out the date value in cell B2), all I have to do is click the Enter button on the Formula bar to have the April total calculated.

Figure 8-4 (sample workbook: Production Schedule 2022.xlsx) shows another example of using AutoSum to instantly build a SUM formula, this time to total the monthly production numbers for Part 100 in cell K3. Again, all I did to create the formula shown in Figure 8-4 was to select cell K3 and then click the Sum button. Again, Excel correctly selected B3:J3 as the range to be summed (rightly ignoring cell A3 with the row title) and input this range as the argument of the SUM function. All that remains to be done is to click the Enter button on the Formula bar to compute the monthly totals for Part 100.

FIGURE 8-4: USING THE AUTOSUM FEATURE TO CREATE A SUM FORMULA THAT TOTALS A ROW OF NUMBERS. (SAMPLE WORKBOOK: PRODUCTION SCHEDULE 2022.XLSX)

SUM												X ✓ fx												=SUM(B3:J3)											
	A	B	C	D	E	F	G	H	I	J	K																								
1	Production Schedule for 2022																																		
2	Part No.	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22																									
3	Part 100	500	485	438	505	483	540	441	550	345	=SUM(B3:J3)																								
4	Part 101	175	170	153	177	169	189	154	193	20	SUM(number1, [number2], ...)																								
5	Part 102	350	340	306	354	338	378	309	385	350																									
6	Part 103	890	863	779	899	859	961	785	979	885																									
7		1915	1858	1676	1934	1848	2068	1689	2107	1780																									
8																																			

If for some reason AutoSum doesn't select the entire or correct range that you want summed, you can adjust the range by dragging the cell cursor through the cell range or by clicking the marquee around the cell range, which turns the *marching ants* into a solid-colored outline. Then position the mouse pointer on one of the sizing handles at the four corners. When the mouse pointer turns into a thick white arrowhead pointing to the center of a pair of black double-crossed arrows, drag the outline until it includes all the cells you want included in the total.

When AutoSum Doesn't Sum

Tip

Although the Sum button's primary function is to build formulas with the SUM function that totals ranges of numbers, that's not its only function (pun intended). Indeed, you can have the AutoSum feature build formulas that compute the average value, count the number of values, or return the highest or lowest value in a range — all you have to do is click the drop-down button that's attached to the Sum command button on the Home tab and then click Average, Count Numbers, Max, or Min from its drop-down menu.

Also, don't forget about the Average, Count, and Sum indicator on the Status bar. This indicator automatically shows you the average value, the count of the numbers, and the total of all numbers in the current cell selection. You can use this feature to preview the total that's to be returned by the SUM formula that you create with the AutoSum button by selecting the cell range that contains the numbers to be summed.