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FREE EBOOK

COMPUTER AND OFFICE SKILLS

Excel Formulas Workbook

Sixty formulas and functions, each with a worked example from school, shop or office

INSIDE THIS BOOK

- Formula basics and operators
- Cell references: relative, absolute and mixed
- Totals, averages and counts
- Counting and adding with conditions
- Making decisions with IF
- ...and 6 more chapters, practice questions and a glossary

Beginner to intermediate

Students, shop owners and office staff who use Excel

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Excel Formulas Workbook

Sixty Excel formulas and functions explained one at a time, each with a small data table and its result, from simple sums to IF, SUMIFS, text and date functions, VLOOKUP and XLOOKUP. Three complete projects (a marksheet, a shop bill and a salary sheet) and a chapter on fixing common errors help you use them in real work.

WHO IT IS FOR	Students, shop owners and office staff who use Excel
LEVEL	Beginner to intermediate
SUBJECT AREA	Computer and office skills
WHAT IS INSIDE	11 chapters, practice questions with answers, and a glossary

HOW TO USE IT

Read one chapter at a time and try the examples as you go: on a computer, at your workbench or in your notebook. The boxes give tips, safety points and short activities. When you finish, test yourself with the practice questions and check your answers at the end. Words you may not know are explained in the glossary.



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What you will find inside

1	Formula basics and operators	4
2	Cell references: relative, absolute and mixed	6
3	Totals, averages and counts	7
4	Counting and adding with conditions	9
5	Making decisions with IF	11
6	Rounding and whole numbers	12
7	Working with text	13
8	Working with dates	15
9	Looking up values	16
10	Three projects: marksheet, shop bill and salary sheet	18
11	Fixing common errors	21
	Practice questions	22
	Answers	24
	Glossary	25

Formula basics and operators

A **formula** is an instruction that tells Excel to calculate something. Every formula starts with an equals sign (=). If you type `5+3` in a cell, Excel just shows the text 5+3. If you type `=5+3`, Excel shows the answer, 8.

Formulas become useful when they point at other cells instead of fixed numbers. Each cell has an address made of its column letter and row number, such as B2. If you type `=B1+B2` and later change the number in B1, the answer updates by itself. This is the whole magic of a spreadsheet.

How to enter a formula

1. Click the cell where you want the answer.
2. Type = and then the formula. You can click a cell instead of typing its address.
3. Press Enter. The cell shows the result; the **formula bar** above the grid shows the formula itself.

To change a formula later, click the cell and edit it in the formula bar, or press F2.

The operators

An **operator** is a symbol that tells Excel what to do with two values.

Operator	Meaning	Example	Result
+	Add	<code>=7+3</code>	10
-	Subtract	<code>=7-3</code>	4
*	Multiply	<code>=7*3</code>	21
/	Divide	<code>=7/2</code>	3.5
^	Power	<code>=7^2</code>	49
&	Join text	<code>= "Pune"&" - 411001"</code>	Pune-411001

Excel follows the BODMAS order you learnt in maths: brackets first, then powers, then multiplication and division, then addition and subtraction. So $=10+5*2$ gives 20, but $=(10+5)*2$ gives 30.

Formulas 1 to 8 on a shop's day

Here is a small practice sheet. Rows 1 to 5 come from Meera's stationery shop in Nagpur; rows 6 to 9 are quick extra examples.

	A	B
1	Opening cash (!)	5000
2	Sales today (!)	3250
3	Expenses today (!)	1180
4	Notebooks sold	24
5	Price of one notebook (!)	45
6	Restaurant bill (!)	1360
7	Friends sharing the bill	4
8	Side of a square plot (m)	12
9	Ravi	Kumar

1. Add. Cash after sales: $=B1+B2$ gives **8250**.

2. Subtract. Cash at closing: $=B1+B2-B3$ gives **7070**.

3. Multiply. Notebook sales: $=B4*B5$ gives **1080**.

4. Divide. Each friend's share: $=B6/B7$ gives **340**.

5. Percentage. Expenses as a part of sales: $=B3/B2$ gives 0.3630769. Click Percent Style on the Home tab and it shows **36%**. You can also write $=B3/B2*100$ to get 36.30769 as a plain number.

6. Power. Area of the plot: $=B8^2$ gives **144** square metres.

7. Join text. Full name: $=A9\&" "&B9$ gives **Ravi Kumar**. The " " in the middle adds a space.

8. Compare. Were sales more than expenses? `=B2>B3` gives **TRUE**. The comparison operators are =, >, <, >= (greater than or equal), <= and <> (not equal).

REMEMBER

Always start with =. A formula without it is just text, and Excel will not calculate it.

TIP

Type numbers without the ! sign or commas, such as 3250, and then format the cells as currency. A typed "! 3,250" may be stored as text, which formulas cannot add.

CHAPTER 2

Cell references: relative, absolute and mixed

When you copy a formula to another cell, Excel adjusts the cell addresses in it. Understanding how it adjusts them is the most important skill in this book.

	A	B	C	D	E
1	Item	Qty	Rate (!)	Amount (!)	After discount (!)
2	Shirt	2	800		
3	Jeans	1	1500		
4	Shoes	1	2200		

Cell H1 holds the discount: 10%.

9. Relative reference. In D2 type `=B2*C2`. The result is **1600**. Now drag the small square at the bottom-right corner of D2 (the **fill handle**) down to D4. Excel writes `=B3*C3` in D3 and `=B4*C4` in D4, giving **1500** and **2200**. The addresses moved down with the formula. This is called a **relative reference**, and it is what you want most of the time.

10. Absolute reference. In E2 type `=D2-D2*$H$1`. The dollar signs lock H1, so it stays H1 when copied. Fill down and you get **1440**, **1350** and **1980**. Without the dollar signs, E3 would look at H2, which is empty, and give the wrong answer. An address with both dollar signs is an **absolute reference**.

11. Mixed reference. Sometimes you lock only the column or only the row. A multiplication table shows why. Put 1 to 5 in A2:A6 and 1 to 5 in B1:F1. In B2 type `=$A2*B$1` and fill it across to F2 and down to F6. `$A` always points at column A, and `$1` always points at row 1. Cell D4 shows **9** (3×3) and F6 shows **25**.

Written as	Column when copied	Row when copied
B2	changes	changes
\$B\$2	fixed	fixed
\$B2	fixed	changes
B\$2	changes	fixed

TIP

While typing a formula, click on an address and press F4. Excel adds the dollar signs for you. Press F4 again to move through the four kinds shown in the table.

TRY THIS

Put a "rate per kg" of 60 in G1. List quantities in kg in A2:A6, and in B2 write a formula for the cost that you can fill down. You should need `$G$1` in it.

CHAPTER 3

Totals, averages and counts

These functions summarise a list. A **function** is a ready-made formula with a name, such as SUM. The values you give it inside the brackets are called **arguments**. A **range** like B2:B9 means every cell from B2 down to B9.

This is the maths test of a Class 9 section in Bhopal. Isha was absent, and Vikram's mark has not been entered yet.

	A	B
1	Student	Maths
2	Aarav	78
3	Diya	92
4	Kabir	65
5	Isha	Absent
6	Rohan	88
7	Sana	90
8	Vikram	
9	Neha	54

12. SUM adds the numbers. `=SUM(B2:B9)` gives **467**. It skips the text "Absent" and the empty cell.

13. AVERAGE finds the mean. `=AVERAGE(B2:B9)` gives **77.83** ($467 \div 6$). Text and blank cells are left out, but a 0 would be counted.

14. MIN finds the smallest number. `=MIN(B2:B9)` gives **54**.

15. MAX finds the largest number. `=MAX(B2:B9)` gives **92**.

16. COUNT counts cells that hold numbers. `=COUNT(B2:B9)` gives **6**.

17. COUNTA counts cells that are not empty, including text. `=COUNTA(B2:B9)` gives **7**.

18. COUNTBLANK counts empty cells. `=COUNTBLANK(B2:B9)` gives **1**, which reminds the teacher that one mark is missing.

19. LARGE finds the second, third or any highest value. `=LARGE(B2:B9, 2)` gives **90**, the second-highest mark.

20. SMALL works the same way from the bottom. `=SMALL(B2:B9, 2)` gives **65**.

21. RANK gives a value's position in a list. `=RANK(B6,$B$2:$B$9)` gives **3** for Rohan, because two students scored more. Lock the range with dollar signs before filling down. If two values tie, they share a rank and the next rank is skipped. Newer versions also offer `RANK.EQ`, which works the same way.

DID YOU KNOW

Select some numbers and look at the bar at the bottom of the Excel window. It shows their Average, Count and Sum without any formula.

REMEMBER

`COUNT` counts numbers only, while `COUNTA` counts anything that is not empty. To count students who appeared, use `COUNT`; to count names on a list, use `COUNTA`.

CHAPTER 4

Counting and adding with conditions

Often you do not want the total of everything, but the total of some things: only Amit's sales, or only the rice. These functions take a **criterion**, a condition that decides which cells count.

Sales register of a provision store in Kanpur:

	A	B	C
1	Salesperson	Product	Sales (!)
2	Amit	Rice	1200
3	Pooja	Sugar	800
4	Amit	Sugar	450
5	Ravi	Rice	2000
6	Pooja	Rice	1500
7	Amit	Oil	950
8	Ravi	Sugar	600

22. COUNTIF counts cells that meet one condition. `=COUNTIF(A2:A8,"Amit")` gives 3 sales by Amit. With numbers, put the comparison in quotes:

`=COUNTIF(C2:C8,">=1000")` gives 3 sales of ! 1,000 or more.

23. SUMIF adds the cells that match. `=SUMIF(A2:A8,"Amit",C2:C8)` gives **2600**. The first range is checked; the last range is added.

24. AVERAGEIF averages the matching cells. `=AVERAGEIF(B2:B8,"Rice",C2:C8)` gives **1566.67**, the average rice sale.

25. COUNTIFS counts rows that meet several conditions at once.

`=COUNTIFS(A2:A8,"Amit",B2:B8,"Sugar")` gives **1**.

26. SUMIFS adds with several conditions.

`=SUMIFS(C2:C8,A2:A8,"Pooja",B2:B8,"Rice")` gives **1500**. Notice that in SUMIFS the range to add comes **first**, while in SUMIF it comes last.

27. AVERAGEIFS averages with several conditions.

`=AVERAGEIFS(C2:C8,B2:B8,"Sugar",C2:C8,">500")` gives **700**, the average of the sugar sales above ! 500 (800 and 600).

Using a cell as the condition

Instead of typing "Amit" into the formula, put the name in a cell, say E1, and write `=SUMIF(A2:A8,E1,C2:C8)`. Now you can type any name in E1 and see that person's total. For a comparison, join the operator to the cell with &:

`=COUNTIF(C2:C8,">="&E2)`.

TIP

Conditions are not case-sensitive. "amit", "Amit" and "AMIT" all match. But an extra space, as in "Amit ", does not match, so keep your data clean.

EXAMPLE

At the end of the month, the shop owner builds a small summary table: names in E1:E3 and `=SUMIF($A$2:$A$8,E1,$C$2:$C$8)` in F1, filled down. Amit shows 2600, Pooja 2300 and Ravi 2600.

Making decisions with IF

The IF function lets a sheet decide between two answers. It asks a question that is either TRUE or FALSE, and gives one value for TRUE and another for FALSE.

The pattern is: `=IF(question, value if true, value if false)`.

A teacher in Amritsar has these results. In this example the pass mark is 33 and the minimum attendance is 75%; your school's rules may be different.

	A	B	C
1	Student	Marks	Attendance %
2	Tanvi	72	90
3	Arjun	28	80
4	Fatima	45	70
5	Harpreet	91	95

28. IF. `=IF(B2>=33, "Pass", "Fail")` gives **Pass** for Tanvi. Filled down, Arjun gets **Fail**. Text answers must be inside double quotes.

29. AND is TRUE only when every condition is true. `=AND(B2>=33, C2>=75)` gives **TRUE** for Tanvi but **FALSE** for Fatima, whose attendance is 70.

30. OR is TRUE when at least one condition is true. A prize for marks of 90 or more OR attendance of 95 or more: `=OR(B5>=90, C5>=95)` gives **TRUE** for Harpreet and **FALSE** for Tanvi.

31. NOT reverses TRUE and FALSE. `=NOT(B3>=33)` gives **TRUE** for Arjun, because it is true that he did not reach 33.

AND and OR are most useful inside IF: `=IF(AND(B2>=33, C2>=75), "Allowed", "Not allowed")` shows **Allowed** for Tanvi and **Not allowed** for Fatima.

32. Nested IF. To give more than two answers, put an IF inside another IF. For grades: `=IF(B2>=75,"A",IF(B2>=60,"B",IF(B2>=33,"C","D")))`. Tanvi (72) gets **B**, Arjun **D**, Fatima **C** and Harpreet **A**. Excel checks from left to right and stops at the first TRUE, so always start with the highest grade.

33. IFS does the same job with less bracket-counting:

`=IFS(B2>=75,"A",B2>=60,"B",B2>=33,"C",TRUE,"D")`. The last pair, TRUE and "D", catches everything else. IFS needs Excel 2019 or later, or Microsoft 365.

34. IFERROR shows something friendlier when a formula fails. If A8 holds 1250 and B8 holds 0, `=A8/B8` shows the error #DIV/0!. `=IFERROR(A8/B8,"Check")` shows **Check** instead.

REMEMBER

Every opening bracket needs a closing bracket. In a nested IF with three IFs, the formula ends with three closing brackets. Excel colours each pair differently to help you.

NOTE

Do not wrap every formula in IFERROR. It hides all errors, including the ones that warn you about a real mistake. Use it only where you expect an error, such as a lookup that may not find a value.

CHAPTER 6

Rounding and whole numbers

Money is usually shown to two decimal places, bills are often rounded to the nearest rupee, and you cannot hire 2.6 buses. These functions handle such cases.

Cell A1 holds the number 1234.567.

35. ROUND rounds to the number of digits you choose. `=ROUND(A1,2)` gives **1234.57**; `=ROUND(A1,0)` gives **1235**; `=ROUND(A1,-2)` rounds to the nearest hundred and gives **1200**. A 5 rounds up, so `=ROUND(2.5,0)` gives 3.

36. ROUNDDUP always rounds up. A school in Shimla is taking 130 students on a trip, and each bus holds 50. `=ROUNDDUP(130/50,0)` gives **3** buses, not 2.6.

37. ROUNDDOWN always rounds down. `=ROUNDDOWN(A1,1)` gives **1234.5**.

38. INT drops the decimal part of a positive number. A sweet shop packs 45 laddoos in boxes of 6. `=INT(45/6)` gives **7** full boxes.

39. MOD gives the remainder after division. `=MOD(45,6)` gives **3** laddoos left over. MOD is also handy for spotting even numbers: `=MOD(A2,2)` is 0 when A2 is even.

40. ABS gives the size of a number without its minus sign. A salesperson's target was ! 5,000 and actual sales were ! 4,200. `=ABS(4200-5000)` gives **800**, the gap, whichever way round it is.

Formatting is not rounding

The Decrease Decimal button on the Home tab only changes how many decimals you see. The full number stays in the cell and is used in later sums. ROUND actually changes the value.

EXAMPLE

Three items cost ! 10.333 each after a discount. Shown with two decimals, each looks like ! 10.33, which adds up to ! 30.99, yet SUM shows ! 31.00 because it adds the hidden digits. Use `=ROUND(price,2)` on each item if the bill must add up exactly as printed.

TRY THIS

A tailor in Surat needs 2.3 metres of cloth per kurta and has 20 metres. Use INT to find how many kurtas she can make, and a formula to find the cloth left over.

CHAPTER 7

Working with text

Text functions clean up names, split codes and build sentences. They are a lifesaver when data is copied from a website or typed by many people.

A

1	DEL-2026-0457
2	priya sharma
3	Priya.Sharma@Example.com
4	aMIT kumar
5	(two spaces) rahul (three spaces) verma (one space)

41. LEFT takes characters from the start. `=LEFT(A1,3)` gives **DEL**, the city code.

42. RIGHT takes characters from the end. `=RIGHT(A1,4)` gives **0457**, the serial number.

43. MID takes characters from the middle: the text, the starting position and how many characters. `=MID(A1,5,4)` gives **2026**.

44. LEN counts characters, including spaces and hyphens. `=LEN(A1)` gives **13**. It is useful for checking that every mobile number in a list has 10 digits.

45. UPPER changes text to capitals. `=UPPER(A2)` gives **PRIYA SHARMA**.

46. LOWER changes text to small letters. `=LOWER(A3)` gives **priya.sharma@example.com**, the usual way to store email addresses.

47. PROPER gives each word a capital first letter. `=PROPER(A4)` gives **Amit Kumar**.

48. TRIM removes extra spaces, keeping single spaces between words. `=TRIM(A5)` gives **rahul verma**. Combine two functions to finish the job: `=PROPER(TRIM(A5))` gives **Rahul Verma**.

49. CONCAT joins pieces of text. If B1 holds Neha and C1 holds Gupta, `=CONCAT(B1," ",C1)` gives **Neha Gupta**. CONCAT needs Excel 2019 or later, or Microsoft 365. Older versions use CONCATENATE, which works the same way, and the & operator works everywhere: `=B1&" "&C1`.

50. TEXT turns a number or date into text with a chosen format. `= "Bill amount: ₹"&TEXT(2450,"#,##0.00")` gives **Bill amount: ₹ 2,450.00**. If D1 holds the date 15 August 2026, `=TEXT(D1,"dd-mmm-yyyy")` gives **15-Aug-2026**.

TIP

After cleaning a column with formulas, you may want plain text without the formulas. Copy the column, then use Paste Special and choose Values.

DID YOU KNOW

Without TEXT, joining a date to words shows a strange number. ="Due on "&D1 might show "Due on 46249", because Excel stores dates as numbers. TEXT fixes that.

CHAPTER 8

Working with dates

Excel stores every date as a number: 1 January 1900 is 1, and each day adds 1. That is why you can subtract one date from another to get the number of days between them, or add 30 to a date to get a due date.

	A	B
1	Date of birth	14-03-2010
2	Today's date for this example	01-10-2026
3	Invoice date	18-09-2026
4	Purchase date	15-01-2026

Dates here are written day-month-year, as in India. Your computer's region setting decides how dates are typed and shown.

51. TODAY gives today's date: =TODAY(). It has no arguments, but the brackets are still needed. It updates every time the file opens.

52. NOW gives today's date and the current time: =NOW(). Format the cell to show the time.

Two simple date sums, with no function at all: the payment due date is =B3+30, which gives **18-10-2026**, and the days since the invoice are =B2-B3, which gives **13**.

53. DATEDIF finds the gap between two dates in complete years, months or days. `=DATEDIF(B1,B2,"Y")` gives **16**, the age in full years. `=DATEDIF(B1,B2,"YM")` gives **6**, the extra months after those years. So the student is 16 years and 6 months old. Use "M" for total months and "D" for days. Excel does not show DATEDIF in its suggestion list, so type it in full; it still works.

54. EDATE gives the date a number of months later. A water purifier bought on 15-01-2026 has an 18-month warranty: `=EDATE(B4,18)` gives **15-07-2027**. If the cell shows a number like 46583, format it as a date. EDATE handles short months sensibly: one month after 31-01-2026 is 28-02-2026.

55. NETWORKDAYS counts working days from Monday to Friday, including both the start and end dates. Put the dates in cells rather than typing them inside the formula, because typed dates depend on the region setting. With 01-10-2026 in E1 and 31-10-2026 in E2, `=NETWORKDAYS(E1,E2)` gives **22**. List the office's holidays in a range, say G1:G2 with 02-10-2026 and 20-10-2026, and `=NETWORKDAYS(E1,E2,G1:G2)` gives **20**.

REMEMBER

TODAY changes every day. For a date that must stay fixed, such as a bill date, press Ctrl+; to type today's date as a value instead.

EXAMPLE

A library in Kochi lends books for 14 days. In the issue register, column C holds the issue date and D holds `=C2+14` as the return date. Column E shows `=IF(TODAY()>D2,"Late","")` to flag late books.

CHAPTER 9

Looking up values

Lookup functions find a value in a table and bring back related information, like finding a name in a phone book and reading the number beside it. Shop bills, fee registers and stock sheets use them all the time.

Price list of a grocery shop in Jaipur (sheet cells A1:D6):

	A	B	C	D
1	Code	Item	Unit	Price (!)
2	P101	Basmati rice	kg	120
3	P102	Toor dal	kg	160
4	P103	Sugar	kg	45
5	P104	Mustard oil	litre	190
6	P105	Tea leaves	250 g	140

56. VLOOKUP searches down the first column of a table and returns a value from another column in the same row. `=VLOOKUP( "P103", $A$2:$D$6, 4, FALSE)` gives **45**. The parts are: what to find, where to look, which column to return (column 4 of the table) and FALSE for an exact match. Leaving out FALSE can give wrong answers, so always include it for codes and names.

57. HLOOKUP does the same across a row. Monthly sales are in A9:E10:

	A	B	C	D	E
9	Month	Jan	Feb	Mar	Apr
10	Sales (!)	42000	38500	51200	47800

`=HLOOKUP( "Mar", B9:E10, 2, FALSE)` gives **51200**.

58. INDEX returns the value at a given position in a range. `=INDEX( B2:B6, 4)` gives **Mustard oil**, the fourth item. `=INDEX( A2:D6, 2, 4)` gives **160**: row 2, column 4 of the table.

59. MATCH finds the position of a value in a list. `=MATCH( "Sugar", B2:B6, 0)` gives **3**. The 0 means exact match.

Together, INDEX and MATCH can look in any direction. VLOOKUP cannot return a column to the left of the one it searches, but this can:

`=INDEX( A2:A6, MATCH( "Sugar", B2:B6, 0) )` gives **P103**, the code for sugar.

60. XLOOKUP is the modern lookup. You give it what to find, the column to search, the column to return and, if you like, a message for when nothing is found.

`=XLOOKUP("Tea leaves", B2:B6, D2:D6, "Not found")` gives **140**, and the same formula with "Ghee" gives **Not found**. It looks left or right and matches exactly by default. XLOOKUP needs Excel 2021 or Microsoft 365; in older versions it shows #NAME?, so use VLOOKUP or INDEX and MATCH there.

TIP

Lock the table range with dollar signs (\$A\$2:\$D\$6) before you fill a lookup formula down. Otherwise the range slides down with each row and stops finding the first items.

DID YOU KNOW

Typing codes instead of item names on a bill avoids spelling mistakes. One letter wrong in "Basmati rice" and the lookup fails; a short code is easier to type correctly.

CHAPTER 10

Three projects: marksheet, shop bill and salary sheet

These projects combine the formulas you have learnt. Build each one yourself; typing the formulas teaches more than reading them.

Project 1: a class marksheet

Columns: A Name, B Hindi, C English, D Maths, E Science, F Social Science (each out of 100). Cell O1 holds the pass mark for each subject; we use 33 as an example.

Name	Hin	Eng	Maths	Sci	SSc	Total	%	Result	Grade	Rank
Ananya	78	85	92	88	81	424	84.8%	Pass	A	2
Mohit	65	58	30	61	70	284	56.8%	Fail	C	4
Sneha	90	88	95	93	89	455	91.0%	Pass	A	1

Name	Hin	Eng	Maths	Sci	SSc	Total	%	Result	Grade	Rank
Imran	72	69	75	80	66	362	72.4%	Pass	B	3

The formulas in row 2, filled down to row 5:

1. Total in G2: `=SUM(B2:F2)`
2. Percentage in H2: `=G2/500`, formatted as a percentage.
3. Result in I2: `=IF(COUNTIF(B2:F2,"<"&$0$1)=0,"Pass","Fail")`. It counts subjects below the pass mark; if there are none, the student passes. Mohit fails because of his 30 in Maths, even though his total is fine.
4. Grade in J2: `=IF(H2>=75%,"A",IF(H2>=60%,"B",IF(H2>=33%,"C","D")))`
5. Rank in K2: `=RANK(G2,$G$2:$G$5)`

Below the table, add a summary: class average `=AVERAGE(G2:G5)` gives 381.25; highest total `=MAX(G2:G5)` gives 455; students passed `=COUNTIF(I2:I5,"Pass")` gives 3; and the topper's name `=INDEX(A2:A5,MATCH(MAX(G2:G5),G2:G5,0))` gives Sneha.

Project 2: a shop bill

	B	C	D	E
1	Item	Qty	Rate (!)	Amount (!)
2	Notebook	6	55	330
3	Ball pen pack	2	50	100
4	Geometry box	1	120	120
5	Drawing file	3	35	105

1. Amount in E2, filled down: `=C2*D2`
2. Subtotal in E6: `=SUM(E2:E5)` gives 655.
3. A 5% discount on bills of ! 500 or more, in E7: `=IF(E6>=500,E6*5%,0)` gives 32.75.
4. After discount, in E8: `=E6-E7` gives 622.25.
5. Bill amount rounded to the rupee, in E9: `=ROUND(E8,0)` gives 622.

6. Number of items: `=COUNTA(B2:B5)` gives 4; total pieces: `=SUM(C2:C5)` gives 12.

To fill rates automatically, keep the price list on a sheet named Prices and use `=VLOOKUP(B2,Prices!$A$2:$B$100,2,FALSE)` in D2. The exclamation mark separates the sheet name from the range.

NOTE

If your business charges GST, the rate depends on the item and the rules change from time to time. Keep each rate in its own cell, never inside a formula, and check current rates on gst.gov.in or with your accountant.

Project 3: a monthly salary sheet

All figures are made up for practice. Statutory deductions such as provident fund have their own rules, so they are left out; ask an accountant before adding them to a real sheet.

Name	Basic (!)	Days in month	Days present	Earned basic	Allowance	OT hours	OT pay	Gross	Advance
Kiran	18000	30	28	16800	2000	5	500	19300	1000
Deepak	15000	30	30	15000	1500	0	0	16500	0
Lata	21000	30	26	18200	2500	8	800	21500	2000

With the overtime rate per hour (! 100 in this example) in M1, the formulas in row 2 are:

1. Earned basic in E2: `=ROUND(B2/C2*D2,0)`. Rounding matters in a 31-day month: $15000 \div 31 \times 29$ is 14032.26, which rounds to 14032.
2. Overtime pay in H2: `=G2*$M$1`
3. Gross in I2: `=E2+F2+H2`
4. Net pay in K2: `=I2-J2`
5. Total net pay: `=SUM(K2:K4)` gives 54300.

TRY THIS

Add a column that shows "Full attendance" when days present equals days in month, and nothing otherwise. Hint: an empty answer is written as "".

CHAPTER 11

Fixing common errors

Every Excel user sees error messages. They are not a disaster; each one tells you what kind of mistake to look for.

Error	What it means	Common cause	How to fix it
#DIV/0!	Division by zero	Dividing by an empty cell or 0	Fill in the missing number, or use <code>=IF (B2=0, "", A2/B2)</code>
#N/A	Not available	A lookup could not find the value	Check spelling and extra spaces; use IFERROR or XLOOKUP's "not found" message
#VALUE!	Wrong kind of value	Doing maths on text, such as "12 kg"*45	Keep units in the heading, numbers in the cells
#REF!	Invalid reference	A cell the formula used was deleted	Undo with Ctrl+Z, or rewrite the formula
#NAME?	Name not recognised	A misspelt function, or text without quotes	Check spelling; put text inside double quotes
#####	Not an error	The column is too narrow to show the number or date	Widen the column

Worked examples

- `=VLOOKUP ("P109", $A$2:$D$6, 4, FALSE)` gives **#N/A**, because there is no item P109 in the price list.

- `=SUMM(B2:B9)` gives **#NAME?**, because SUMM is not a function.
- `=IF(B2>=33,Pass,Fail)` also gives **#NAME?**, because Pass and Fail need quotes.
- If D2 holds `=B2*C2` and you delete column C, the formula turns into `=B2*#REF!`.

Finding the cause

- Click the cell and read the formula in the formula bar. Excel colours each address and draws a box of the same colour around that cell, so you can see what the formula uses.
- On the Formulas tab, **Evaluate Formula** shows the calculation one step at a time, and **Trace Precedents** draws arrows to the cells the formula depends on.
- A small green triangle in the corner of a cell is a warning, not an error. It often means a number is stored as text. Click the cell and the warning button that appears explains it.

TIP

Press Ctrl+` (the key left of 1) to see every formula on the sheet instead of the results. It is the quickest way to check a whole sheet. Press it again to go back.

REMEMBER

If your computer's region setting uses a semicolon instead of a comma between arguments, write `=ROUND(A1;2)` instead of `=ROUND(A1,2)`. Excel shows the right separator in the tip box as you type.

CHECK YOURSELF

Practice questions

1. What must every Excel formula start with?
2. What results do `=10+5*2` and `=(10+5)*2` give, and why are they different?
3. Cell B3 holds 1180 and B2 holds 3250. Write a formula for B3 as a percentage of B2, and say how you show it as a percentage.

4. What is the difference between B2, \$B\$2 and B\$2 when a formula is copied?
5. Which key adds dollar signs to a cell address while you type a formula?
6. A range holds 78, 92, "Absent", an empty cell and 54. What do COUNT and COUNTA give?
7. Which function finds the second-highest value in a list?
8. Write a formula to add the sales in C2:C8 made by "Pooja", whose names are in A2:A8.
9. In SUMIFS, which range comes first: the range to add or the range to check?
10. Write a formula to count the cells in C2:C8 that are ! 1,000 or more.
11. Write an IF formula that shows "Pass" when B2 is 33 or more and "Fail" otherwise.
12. What does =AND(B2>=33, C2>=75) give when B2 is 45 and C2 is 70?
13. Why should a nested IF for grades start with the highest grade?
14. 130 students are going on a trip and each bus holds 50. Which formula gives the number of buses?
15. 45 laddoos are packed in boxes of 6. Which two functions give the full boxes and the leftover laddoos?
16. Cell A1 holds DEL-2026-0457. Write formulas to get "DEL" and "2026".
17. A name has been typed as " rahul verma ". Which formula turns it into "Rahul Verma"?
18. What does =DATEDIF(B1, B2, "Y") find?
19. A product bought on 15-01-2026 has an 18-month warranty. Which function gives the end date, and what is the date?
20. In =VLOOKUP(G1, \$A\$2:\$D\$6, 4, FALSE), what do the 4 and the FALSE mean?
21. Why can INDEX and MATCH do something VLOOKUP cannot?
22. A colleague's XLOOKUP formula shows #NAME? on an older computer. What is the likely reason?

23. What does #DIV/0! mean, and how can you avoid it?
24. A cell shows #####. Is this an error, and what should you do?

ANSWER KEY

Answers

1. An equals sign (=). Without it, Excel treats the entry as text.
2. 20 and 30. Excel multiplies before it adds, but brackets are worked out first.
3. =B3/B2, then click Percent Style on the Home tab. It shows 36%.
4. B2 changes both column and row; \$B\$2 never changes; B\$2 lets the column change but keeps row 2 fixed.
5. F4.
6. COUNT gives 3 (numbers only) and COUNTA gives 4 (every cell that is not empty).
7. LARGE, for example =LARGE(B2:B9,2).
8. =SUMIF(A2:A8,"Pooja",C2:C8).
9. The range to add comes first in SUMIFS, followed by pairs of a range and a condition.
10. =COUNTIF(C2:C8,">=1000").
11. =IF(B2>=33,"Pass","Fail").
12. FALSE, because the second condition (attendance of at least 75) is not met.
13. Excel stops at the first condition that is TRUE. If a lower grade came first, a high mark such as 91 would also pass that test and get the lower grade.
14. =ROUNDUP(130/50,0), which gives 3.
15. =INT(45/6) gives 7 full boxes and =MOD(45,6) gives 3 left over.
16. =LEFT(A1,3) gives DEL and =MID(A1,5,4) gives 2026.
17. =PROPER(TRIM(A5)), where A5 holds the name. TRIM removes the extra spaces and PROPER fixes the capitals.
18. The number of complete years between the two dates, such as a person's age.
19. EDATE: =EDATE(B4,18) gives 15-07-2027 (format the cell as a date).
20. 4 means return the value from the fourth column of the table; FALSE means find an exact match only.
21. VLOOKUP can only return columns to the right of the column it searches. INDEX and MATCH can return a value from any column, including one on the left.

22. XLOOKUP needs Excel 2021 or Microsoft 365. Older versions do not know it, so they show #NAME?. Use VLOOKUP or INDEX and MATCH instead.
23. It means a number is being divided by zero or by an empty cell. Fill in the missing value, or use a formula such as `=IF (B2=0, "", A2/B2)`.
24. No, it is not an error. The column is too narrow to show the value; widen it.

WORD LIST

Glossary

Formula

an instruction that starts with = and tells Excel to calculate something.

Function

a ready-made formula with a name, such as SUM or IF.

Argument

a value or range you give a function inside its brackets.

Cell address

the column letter and row number that name a cell, such as B2.

Range

a block of cells written with a colon, such as B2:B9.

Operator

a symbol such as +, -, *, / or & that tells Excel what to do with values.

Formula bar

the strip above the grid that shows the formula in the selected cell.

Fill handle

the small square at the bottom-right corner of a selected cell, dragged to copy a formula.

Relative reference

a cell address that changes when the formula is copied, such as B2.

Absolute reference

a cell address locked with dollar signs, such as \$B\$2, that does not change when copied.

Mixed reference

an address with only the column or only the row locked, such as \$B2 or B\$2.

Criterion

a condition, such as ">=1000" or "Amit", that decides which cells are counted or added.

Nested IF

an IF function placed inside another IF to choose between more than two answers.

Logical value

the answer TRUE or FALSE.

Lookup

finding a value in a table and returning related information from the same row or column.

Exact match

a lookup setting that accepts only a value that is exactly the same.

Serial number (date)

the number Excel uses to store a date, counting days from 1 January 1900.

Working days

Monday to Friday, as counted by NETWORKDAYS, less any listed holidays.

Error value

a message such as #N/A or #DIV/0! that shows a formula cannot give an answer.

Paste Special (Values)

pasting only the results of formulas, without the formulas themselves.



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