GENERAL

ms excel all formulas with examples

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MS Excel All Formulas with Examples: A Complete Guide

Microsoft Excel remains the gold standard for data manipulation, financial modeling, and everyday spreadsheet tasks. At the heart of its power are formulas – the building blocks that turn raw numbers into actionable insights. Whether you're a student crunching class grades, a business analyst forecasting revenue, or a hobbyist organizing a family budget, mastering Excel's formulas can save hours of manual work and reduce errors dramatically.

In this guide we'll walk through every major category of Excel formulas, provide clear examples, and show you how to combine them for complex calculations. By the end, you'll have a practical reference to pull from whenever you need to solve a spreadsheet challenge.

1. Arithmetic and Basic Functions

These are the foundation of any Excel workbook. They perform simple mathematical operations and aggregate data.

- SUM – Adds a range of cells. =SUM(A1:A10)
- AVERAGE – Calculates the mean. =AVERAGE(B1:B10)
- MIN / MAX – Finds the smallest or largest value. =MIN(C1:C10) or =MAX(C1:C10)
- COUNT – Counts numeric entries. =COUNT(D1:D10)
- COUNTA – Counts all non-empty cells. =COUNTA(E1:E10)

Example: Suppose you have a sales list in column A (units) and column B (price). To calculate total revenue you could use =SUMPRODUCT(A1:A20, B1:B20). The SUMPRODUCT function multiplies corresponding pairs and sums them, giving you a quick revenue figure.

2. Logical Functions

Logical functions let you test conditions and return values based on those tests.

- IF – Returns one value if a condition is true, another if false. =IF(F1>100, "High", "Low")
- AND / OR – Combine multiple conditions. =IF(AND(G1>50, H1<200), "In Range", "Out of Range")
- NOT – Inverts a logical value. =NOT(I1=TRUE)

Example: You want to flag overdue tasks. If the due date in column J is before today, mark it "Overdue". Use =IF(J1<TODAY(), "Overdue", "On Time"). Drag this down to apply to the entire list.

3. Lookup and Reference Functions

These functions pull data from tables or ranges based on a key.

- VLOOKUP – Searches a vertical table. =VLOOKUP(K1, M1:N20, 2, FALSE)
- HLOOKUP – Searches a horizontal table. =HLOOKUP(L1, O1:O10, 2, FALSE)
- INDEX – Returns a value from a specified position. =INDEX(P1:P10, 3)
- MATCH – Finds the position of a value. =MATCH(Q1, R1:R10, 0)
- XLOOKUP – Newer, flexible lookup. =XLOOKUP(S1, T1:T20, U1:U20, "Not Found")

Example: You have a product list in columns W (ID) and X (Price). To get the price of a product with ID in cell Y1, use =VLOOKUP(Y1, W1:X100, 2, FALSE). If the ID is missing, the formula returns #N/A, which you can catch with

IFERROR (see Section 8).

4. Text Manipulation Functions

Excel treats text as a string, and these functions help you format, split, and combine strings.

- CONCAT / CONCATENATE – Joins text. =CONCAT(A1, " ", B1)
- TEXTJOIN – Joins with a delimiter. =TEXTJOIN(", ", TRUE, C1:C5)
- LEFT / RIGHT / MID – Extracts substrings. =LEFT(D1, 3)
- TRIM – Removes extra spaces. =TRIM(E1)
- UPPER / LOWER / PROPER – Changes case. =PROPER(F1)
- FIND / SEARCH – Locates a substring. =FIND("apple", G1)
- REPLACE / SUBSTITUTE – Replaces text. =SUBSTITUTE(H1, "old", "new")

Example: You have a full name in column I. To create a username by combining the first letter of the first name and the entire last name, use =LOWER(LEFT(I1,1)&RIGHT(I1, LEN(I1)-FIND(" ", I1))). This will produce a lowercase username like “jdoe”.

5. Date and Time Functions

Managing dates and times accurately is vital for scheduling, forecasting, and reporting.

- TODAY / NOW – Current date or date/time. =TODAY() or =NOW()
- DATE / TIME – Builds a date or time from components. =DATE(2024,9,5)
- YEAR / MONTH / DAY – Extract parts of a date. =MONTH(J1)
- DATEDIF – Calculates the difference between dates. =DATEDIF(K1, L1, "d")
- EDATE / EOMONTH – Shifts dates by months. =EDATE(M1, 3) or =EOMONTH(N1, -1)
- WORKDAY / NETWORKDAYS – Counts working days. =WORKDAY(O1, 10)

Example: To calculate the number of business days between two dates in P1 and Q1, use =NETWORKDAYS(P1, Q1). If you want to schedule a follow up 15 working days after a meeting date in R1, use =WORKDAY(R1, 15).

6. Statistical Functions

Excel offers a wide array of functions to analyze data distributions.

- COUNTIF / SUMIF / AVERAGEIF – Conditional counting, summing, averaging. =COUNTIF(S1:S100, ">50")
- COUNTIFS / SUMIFS / AVERAGEIFS – Multiple conditions. =SUMIFS(T1:T100, U1:U100, ">30", V1:V100, "
- STDEV / VAR – Standard deviation and variance. =STDEV(W1:W50)
- PERCENTILE / PERCENTILE.EXC / PERCENTILE.INC – Find percentiles. =PERCENTILE.INC(X1:X100, 0.75)
- MEDIAN / MODE – Median and mode. =MEDIAN(Y1:Y30)

Example: You have test scores in column Z. To find the average score of students who scored above 80, use =AVERAGEIF(Z1:Z100, ">80"). For a weighted average where weights are in AA1:AA100, use =SUMPRODUCT(Z1:Z100, AA1:AA100)/SUM(AA1:AA100).

7. Math, Trigonometry, and Engineering Functions

These functions perform advanced numeric calculations.

- POWER / SQRT – Exponentiation and square root. =POWER(B1, 3) or =SQRT(C1)
- PI – Returns the value of < à =PI()
- RADIANS / DEGREES – Convert between degrees and radians. =DEGREES(D1)
- SIN / COS / TAN – Trigonometric functions. =SIN(E1)

- MOD / INT – Remainder and integer part. =MOD(F1, 2) or =INT(G1)
- ROUND / ROUNDUP / ROUNDDOWN – Rounding. =ROUND(H1, 2)
- LOG / LOG10 / EXP – Logarithms and exponentials. =LOG(I1, 10)

Example: To compute the area of a circle with radius in J1, use =PI()*POWER(J1, 2). If you need to find the angle in degrees for a slope value in K1, use =DEGREES(ATAN(K1)).

8. Financial Functions

Excel’s financial toolbox is indispensable for budgeting, loans, and investment analysis.

- PMT – Loan payment. =PMT(0.05/12, 60, -10000)
- PV / FV – Present and future value. =PV(0.05, 10, -2000)

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