

COURSE CENTRALS

Excel Formulas Cheat Sheet

Essential Excel formulas explained in plain English

Formula	Syntax	When to use it
XLOOKUP	=XLOOKUP(...)	Find a value and return matching information.

Quick reference for students, analysts and professionals

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How to use this guide

This is a quick-reference guide, not a textbook. Find the task you are trying to complete, scan the formula syntax, and use the plain-English description to decide whether the function fits.

- | | |
|---|--|
| 1 | Start with the task
Think about what you want Excel to do: add, count, look up, filter, clean text, calculate dates or test a condition. |
| 2 | Read the syntax
Arguments inside square brackets are optional. Excel may show additional optional arguments depending on the function. |
| 3 | Use the formula bar
Type = followed by the function name. Excel will display argument hints as you build the formula. |
| 4 | Prefer readable formulas
For complex workbooks, functions such as LET can make formulas easier to maintain. |

Note: Function availability can vary by Excel version and platform. Modern dynamic-array functions are primarily intended for current Microsoft 365 / newer Excel releases.

Formula guide

Use the categories below to jump quickly to the type of task you need.

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01 Excel essentials

Start with the formulas used in almost every workbook.

Formula	Syntax	When it is used
SUM	=SUM(range)	Add numbers across a range.
AVERAGE	=AVERAGE(range)	Calculate the arithmetic mean.
MIN	=MIN(range)	Return the smallest number.
MAX	=MAX(range)	Return the largest number.
COUNT	=COUNT(range)	Count cells containing numbers.
COUNTA	=COUNTA(range)	Count non-empty cells.
COUNTBLANK	=COUNTBLANK(range)	Count empty cells.
MEDIAN	=MEDIAN(range)	Return the middle value in a set.
ROUND	=ROUND(number,num_digits)	Round a number to a chosen number of digits.
ROUNDUP	=ROUNDUP(number,num_digits)	Always round a number away from zero.
ROUNDDOWN	=ROUNDDOWN(number,num_digits)	Always round a number toward zero.
ABS	=ABS(number)	Return a number without its sign.

02 Conditional totals & counts

Use criteria to count, sum or average only the rows you need.

Formula	Syntax	When it is used
COUNTIF	=COUNTIF(range,criteria)	Count cells matching one condition.
COUNTIFS	=COUNTIFS(range1,criteria1,...)	Count rows matching multiple conditions.
SUMIF	=SUMIF(range,criteria,[sum_range])	Add values matching one condition.
SUMIFS	=SUMIFS(sum_range,range1,criteria1,...)	Add values matching multiple conditions.
AVERAGEIF	=AVERAGEIF(range,criteria,[average_range])	Average values matching one condition.
AVERAGEIFS	=AVERAGEIFS(avg_range,range1,criteria1,...)	Average values matching multiple conditions.
MAXIFS	=MAXIFS(max_range,range1,criteria1,...)	Return the largest value matching conditions.
MINIFS	=MINIFS(min_range,range1,criteria1,...)	Return the smallest value matching conditions.

03 IF & logical formulas

Build rules, classifications and decision logic inside a workbook.

Formula	Syntax	When it is used
IF	=IF(test,value_if_true,value_if_false)	Return one result when a condition is true and another when false.
IFS	=IFS(test1,result1,test2,result2,...)	Evaluate several conditions without deeply nested IF formulas.
AND	=AND(test1,test2,...)	Return TRUE only when every condition is true.
OR	=OR(test1,test2,...)	Return TRUE when at least one condition is true.
NOT	=NOT(logical)	Reverse TRUE to FALSE or FALSE to TRUE.
IFERROR	=IFERROR(value,value_if_error)	Replace formula errors with a cleaner result.
IFNA	=IFNA(value,value_if_na)	Replace only #N/A errors.
SWITCH	=SWITCH(expression,value1,result1,...)	Map one expression to several possible results.

04 Lookup & reference

Find matching records and return information from tables.

Formula	Syntax	When it is used
XLOOKUP	=XLOOKUP(lookup,lookup_array,return_array,[if_not_found])	Find a value and return the matching item from another range.
XMATCH	=XMATCH(lookup,lookup_array,[match_mode])	Return the relative position of a matching item.
INDEX	=INDEX(array,row_num,[column_num])	Return a value at a specified row and column.
MATCH	=MATCH(lookup,lookup_array,[match_type])	Return the position of a matching value.
VLOOKUP	=VLOOKUP(lookup,table,col_index,[range_lookup])	Look down the first column of a table and return a value to the right.
HLOOKUP	=HLOOKUP(lookup,table,row_index,[range_lookup])	Look across the top row of a table and return a value below.
CHOOSE	=CHOOSE(index_num,value1,value2,...)	Return an item from a list using its position.
OFFSET	=OFFSET(reference,rows,cols,[height],[width])	Return a reference shifted from a starting cell.
INDIRECT	=INDIRECT(ref_text)	Turn text into a cell or range reference.

05 Dynamic arrays

Create spill ranges that resize automatically in modern Excel.

Formula	Syntax	When it is used
FILTER	=FILTER(array,include,[if_empty])	Return only rows or columns that meet a condition.
UNIQUE	=UNIQUE(array)	Return distinct values from a range.
SORT	=SORT(array,[sort_index],[sort_order])	Sort a range dynamically.
SORTBY	=SORTBY(array,by_array,[sort_order])	Sort one range using values from another range.
SEQUENCE	=SEQUENCE(rows,[columns],[start],[step])	Generate a sequence of numbers automatically.
TAKE	=TAKE(array,rows,[columns])	Return a selected number of rows or columns from an array.
DROP	=DROP(array,rows,[columns])	Remove a selected number of rows or columns from an array.
CHOOSECOLS	=CHOOSECOLS(array,col_num1,...)	Return selected columns from an array.
CHOOSEROWS	=CHOOSEROWS(array,row_num1,...)	Return selected rows from an array.

06 Text formulas

Clean, combine, split and standardize text values.

Formula	Syntax	When it is used
LEFT	=LEFT(text,[num_chars])	Return characters from the beginning of text.
RIGHT	=RIGHT(text,[num_chars])	Return characters from the end of text.
MID	=MID(text,start_num,num_chars)	Return characters from the middle of text.
LEN	=LEN(text)	Count characters in text.
TRIM	=TRIM(text)	Remove extra spaces while keeping single spaces between words.
CLEAN	=CLEAN(text)	Remove non-printing characters.
UPPER	=UPPER(text)	Convert text to uppercase.
LOWER	=LOWER(text)	Convert text to lowercase.
PROPER	=PROPER(text)	Capitalize the first letter of each word.
CONCAT	=CONCAT(text1,text2,...)	Join text values together.
TEXTJOIN	=TEXTJOIN(delimiter,ignore_empty,text1,...)	Join text using a chosen separator.
TEXT	=TEXT(value,"format_code")	Convert a number or date to formatted text.
VALUE	=VALUE(text)	Convert numeric text into a number.
FIND	=FIND(find_text,within_text,[start_num])	Find the position of text with case sensitivity.
SEARCH	=SEARCH(find_text,within_text,[start_num])	Find the position of text without case sensitivity.
SUBSTITUTE	=SUBSTITUTE(text,old_text,new_text,[instance])	Replace matching text.
REPLACE	=REPLACE(old_text,start_num,num_chars,new_text)	Replace characters by position.

07 Split & extract text

Useful for imported data, names, codes and delimited fields.

Formula	Syntax	When it is used
TEXTSPLIT	=TEXTSPLIT(text,col_delimiter,[row_delimiter])	Split text into columns or rows using a delimiter.
TEXTBEFORE	=TEXTBEFORE(text,delimiter,[instance_num])	Return text that appears before a delimiter.
TEXTAFTER	=TEXTAFTER(text,delimiter,[instance_num])	Return text that appears after a delimiter.
EXACT	=EXACT(text1,text2)	Check whether two text strings match exactly, including case.
T	=T(value)	Return text when the value is text; otherwise return empty text.

08 Dates & time

Create, extract and calculate with dates and times.

Formula	Syntax	When it is used
TODAY	=TODAY()	Return the current date.
NOW	=NOW()	Return the current date and time.
DATE	=DATE(year,month,day)	Build a valid date from separate year, month and day values.
YEAR	=YEAR(date)	Extract the year from a date.
MONTH	=MONTH(date)	Extract the month number from a date.
DAY	=DAY(date)	Extract the day of the month.
WEEKDAY	=WEEKDAY(date,[return_type])	Return the weekday number for a date.
WEEKNUM	=WEEKNUM(date,[return_type])	Return the week number of the year.
EDATE	=EDATE(start_date,months)	Move a date forward or backward by whole months.
EOMONTH	=EOMONTH(start_date,months)	Return the final day of a month.
DATEDIF	=DATEDIF(start_date,end_date,"unit")	Return elapsed years, months or days between two dates.
DAYS	=DAYS(end_date,start_date)	Return the number of days between two dates.
NETWORKDAYS	=NETWORKDAYS(start_date,end_date,[holidays])	Count working days between two dates.
WORKDAY	=WORKDAY(start_date,days,[holidays])	Return a date a chosen number of working days away.

09 Math & statistics

Analyze distributions, rankings and numeric patterns.

Formula	Syntax	When it is used
SUMPRODUCT	=SUMPRODUCT(array1,[array2],...)	Multiply corresponding values and add the results.
SUBTOTAL	=SUBTOTAL(function_num,ref1,...)	Calculate totals that can respond to filtered lists.
AGGREGATE	=AGGREGATE(function_num,options,array,...)	Calculate aggregates while optionally ignoring errors or hidden rows.
RANK.EQ	=RANK.EQ(number,ref,[order])	Rank a number within a list.
LARGE	=LARGE(array,k)	Return the k-th largest value.
SMALL	=SMALL(array,k)	Return the k-th smallest value.
PERCENTILE.INC	=PERCENTILE.INC(array,k)	Return a percentile value from a dataset.
QUARTILE.INC	=QUARTILE.INC(array,quart)	Return a quartile from a dataset.
STDEV.S	=STDEV.S(number1,...)	Estimate standard deviation from a sample.
CORREL	=CORREL(array1,array2)	Measure linear correlation between two datasets.
MOD	=MOD(number,divisor)	Return the remainder after division.
INT	=INT(number)	Round a number down to the nearest integer.

10 Financial formulas

Common formulas for loans, investments and cash-flow analysis.

Formula	Syntax	When it is used
PMT	=PMT(rate,nper,pv,[fv],[type])	Calculate the periodic payment for a loan or annuity.
PV	=PV(rate,nper,pmt,[fv],[type])	Calculate present value.
FV	=FV(rate,nper,pmt,[pv],[type])	Calculate future value.
NPV	=NPV(rate,value1,[value2],...)	Calculate net present value for periodic cash flows.
XNPV	=XNPV(rate,values,dates)	Calculate net present value using actual cash-flow dates.
IRR	=IRR(values,[guess])	Estimate the internal rate of return for periodic cash flows.
XIRR	=XIRR(values,dates,[guess])	Estimate internal rate of return using actual dates.
IPMT	=IPMT(rate,per,nper,pv,[fv],[type])	Calculate the interest portion of a payment.
PPMT	=PPMT(rate,per,nper,pv,[fv],[type])	Calculate the principal portion of a payment.
RATE	=RATE(nper,pmt,pv,[fv],[type],[guess])	Estimate the interest rate per period.

11 Formula building tools

Make complex formulas easier to read, reuse and maintain.

Formula	Syntax	When it is used
LET	=LET(name1,value1,calculation)	Name intermediate values inside a formula to improve readability and efficiency.
LAMBDA	=LAMBDA([parameter1,...],calculation)	Create reusable custom functions without VBA.
ISBLANK	=ISBLANK(value)	Check whether a cell is empty.
ISNUMBER	=ISNUMBER(value)	Check whether a value is numeric.
ISTEXT	=ISTEXT(value)	Check whether a value is text.
ISERROR	=ISERROR(value)	Check whether a value is any Excel error.
ISNA	=ISNA(value)	Check specifically for #N/A.
FORMULATEXT	=FORMULATEXT(reference)	Return a formula as text.

A-Z quick index

A compact index of every function included in this guide.

ABS Excel essentials	AGGREGATE Math & statistics	AND IF & logical formulas
AVERAGE Excel essentials	AVERAGEIF Conditional totals & counts	AVERAGEIFS Conditional totals & counts
CHOOSE Lookup & reference	CHOOSECOLS Dynamic arrays	CHOOSEROWS Dynamic arrays
CLEAN Text formulas	CONCAT Text formulas	CORREL Math & statistics
COUNT Excel essentials	COUNTA Excel essentials	COUNTBLANK Excel essentials
COUNTIF Conditional totals & counts	COUNTIFS Conditional totals & counts	DATE Dates & time
DATEDIF Dates & time	DAY Dates & time	DAYS Dates & time
DROP Dynamic arrays	EDATE Dates & time	EOMONTH Dates & time
EXACT Split & extract text	FILTER Dynamic arrays	FIND Text formulas
FORMULATEXT Formula building tools	FV Financial formulas	HLOOKUP Lookup & reference
IF IF & logical formulas	IFERROR IF & logical formulas	IFNA IF & logical formulas
IFS IF & logical formulas	INDEX Lookup & reference	INDIRECT Lookup & reference
INT Math & statistics	IPMT Financial formulas	IRR Financial formulas
ISBLANK Formula building tools	ISERROR Formula building tools	ISNA Formula building tools
ISNUMBER Formula building tools	ISTEXT Formula building tools	LAMBDA Formula building tools
LARGE Math & statistics	LEFT Text formulas	LEN Text formulas
LET Formula building tools	LOWER Text formulas	MATCH Lookup & reference
MAX Excel essentials	MAXIFS Conditional totals & counts	MEDIAN Excel essentials
MID Text formulas	MIN Excel essentials	MINIFS Conditional totals & counts
MOD Math & statistics	MONTH Dates & time	NETWORKDAYS Dates & time
NOT IF & logical formulas	NOW Dates & time	NPV Financial formulas
OFFSET Lookup & reference	OR IF & logical formulas	PERCENTILE.INC Math & statistics
PMT Financial formulas	PPMT Financial formulas	PROPER Text formulas
PV Financial formulas	QUARTILE.INC Math & statistics	RANK.EQ Math & statistics
RATE Financial formulas	REPLACE Text formulas	RIGHT Text formulas
ROUND Excel essentials	ROUNDDOWN Excel essentials	ROUNDUP Excel essentials
SEARCH Text formulas	SEQUENCE Dynamic arrays	SMALL Math & statistics
SORT Dynamic arrays	SORTBY Dynamic arrays	STDEV.S Math & statistics

SUBSTITUTE Text formulas	SUBTOTAL Math & statistics	SUM Excel essentials
SUMIF Conditional totals & counts	SUMIFS Conditional totals & counts	SUMPRODUCT Math & statistics
SWITCH IF & logical formulas	T Split & extract text	TAKE Dynamic arrays
TEXT Text formulas	TEXTAFTER Split & extract text	TEXTBEFORE Split & extract text
TEXTJOIN Text formulas	TEXTSPLIT Split & extract text	TODAY Dates & time
TRIM Text formulas	UNIQUE Dynamic arrays	UPPER Text formulas
VALUE Text formulas	VLOOKUP Lookup & reference	WEEKDAY Dates & time
WEEKNUM Dates & time	WORKDAY Dates & time	XIRR Financial formulas
XLOOKUP Lookup & reference	XMATCH Lookup & reference	XNPV Financial formulas
YEAR Dates & time		

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