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EXCEL FORMULA SHEET !!!!! BASIC TO ADVANCED

What this guide includes

A practical reference of Excel formulas grouped by use: arithmetic, logical tests, text cleanup, dates, lookups, dynamic arrays, statistics, finance, database functions, engineering conversions, and real-world business calculations.

How to use it

1. Every formula starts with **=**. 2. Replace sample cells like A2 or B2 with your own cell references. 3. Text conditions go inside double quotes, e.g. "Paid". 4. If your Excel uses semicolons as separators, replace commas with semicolons. 5. Some newer functions require Microsoft 365 or a recent Excel version.

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Tip: Use your PDF reader's search feature to find a function name quickly.

1. Formula Basics & Operators

Formula / Example	Function / Use	What it does
`=A1+B1`	Add two cells	Adds values in A1 and B1.
`=A1-B1`	Subtract	Subtracts B1 from A1.
`=A1*B1`	Multiply	Multiplies values.
`=A1/B1`	Divide	Divides A1 by B1; B1 must not be zero.
`=A1^2`	Power	Squares A1.
`=SUM(A1:A10)`	Sum a range	Adds values in A1 through A10.
`=A1&" "&B1`	Join text	Combines A1, a space, and B1.
`=$A$1*B1`	Absolute reference	$A$1 stays fixed when copied.
`=A$1+$B2`	Mixed references	Locks row 1 and column B respectively.

2. Math & Rounding

Formula / Example	Function / Use	What it does
`=SUM(A2:A20)`	SUM	Adds numbers.
`=PRODUCT(A2:A5)`	PRODUCT	Multiplies numbers.
`=ABS(A2)`	ABS	Returns absolute value.
`=ROUND(A2,2)`	ROUND	Rounds to 2 decimal places.
`=ROUNDUP(A2,0)`	ROUNDUP	Rounds away from zero.
`=ROUNDDOWN(A2,0)`	ROUNDDOWN	Rounds toward zero.
`=INT(A2)`	INT	Rounds down to an integer.
`=TRUNC(A2,2)`	TRUNC	Removes digits after 2 decimals.
`=MOD(A2,B2)`	MOD	Returns remainder.
`=QUOTIENT(A2,B2)`	QUOTIENT	Integer portion of division.
`=POWER(A2,3)`	POWER	Raises A2 to the power of 3.
`=SQRT(A2)`	SQRT	Square root.
`=SIGN(A2)`	SIGN	Returns -1, 0, or 1.
`=RAND()`	RAND	Random decimal from 0 to 1; recalculates.
`=RANDBETWEEN(1,100)`	RANDBETWEEN	Random integer from 1 to 100.
`=PI()`	PI	Value of pi.
`=CEILING.MATH(A2,5)`	CEILING.MATH	Rounds up to a multiple of 5.

=FLOOR.MATH(A2,5)	FLOOR.MATH	Rounds down to a multiple of 5.
=MROUND(A2,5)	MROUND	Rounds to nearest multiple of 5.
=SUBTOTAL(9,A2:A20)	SUBTOTAL	Sum that can ignore filtered-out rows.
=AGGREGATE(9,6,A2:A20)	AGGREGATE	Can aggregate while ignoring errors.

3. Counting & Statistics

Formula / Example	Function / Use	What it does
=COUNT(A2:A20)	COUNT	Counts numeric cells.
=COUNTA(A2:A20)	COUNTA	Counts non-empty cells.
Formula / Example	**Function / Use**	**What it does**
=COUNTBLANK(A2:A20)	COUNTBLANK	Counts blank cells.
=COUNTIF(B2:B20,"Pass")	COUNTIF	Counts cells meeting one condition.
=COUNTIFS(B2:B20,"Pass",C2:C20,">=60")	COUNTIFS	Counts rows meeting multiple conditions.
=AVERAGE(A2:A20)	AVERAGE	Mean of numeric values.
=AVERAGEIF(B2:B20,"East",C2:C20)	AVERAGEIF	Average for one condition.
=AVERAGEIFS(C2:C20,A2:A20,"East",B2:B20,"Online")	AVERAGEIFS	Average for multiple conditions.
=MAX(A2:A20)	MAX	Largest value.
=MIN(A2:A20)	MIN	Smallest value.
=MEDIAN(A2:A20)	MEDIAN	Middle value.
=MODE.SNGL(A2:A20)	MODE.SNGL	Most frequent value.
=LARGE(A2:A20,2)	LARGE	Second-largest value.
=SMALL(A2:A20,2)	SMALL	Second-smallest value.
=RANK.EQ(A2,$A$2:$A$20,0)	RANK.EQ	Rank descending; 0 means largest is rank 1.
=PERCENTILE.INC(A2:A20,0.9)	PERCENTILE.INC	90th percentile.
=QUARTILE.INC(A2:A20,1)	QUARTILE.INC	First quartile.
=STDEV.S(A2:A20)	STDEV.S	Sample standard deviation.
=VAR.S(A2:A20)	VAR.S	Sample variance.

4. Logical & Error Handling

Formula / Example	Function / Use	What it does
=IF(B2>=40,"Pass","Fail")	IF	Returns one result when true, another when false.

=IFS(A2>=90,"A",A2>=75,"B",A2>=60,"C",TRUE,"D")	IFS	Checks multiple conditions in order.
=AND(A2>=40,B2>=40)	AND	TRUE only if all conditions are true.
=OR(A2="Yes",B2="Yes")	OR	TRUE if at least one condition is true.
=NOT(A2="Paid")	NOT	Reverses TRUE/FALSE.
=XOR(A2="Yes",B2="Yes")	XOR	TRUE if an odd number of conditions is true.
=IFERROR(A2/B2,0)	IFERROR	Shows 0 if formula returns an error.
=IFNA(XLOOKUP(E2,A:A,B:B),"Not found")	IFNA	Handles #N/A only.
=SWITCH(A2,"A","Excellent","B","Good","Other")	SWITCH	Matches a value to listed cases.
=IF(AND(B2>=40,C2>=40),"Pass","Fail")	Nested logic	Pass only when both marks meet 40.

5. Text Functions

Formula / Example	Function / Use	What it does
=LEFT(A2,3)	LEFT	First 3 characters.
=RIGHT(A2,4)	RIGHT	Last 4 characters.
=MID(A2,2,5)	MID	5 characters starting at position 2.
=LEN(A2)	LEN	Number of characters including spaces.
Formula / Example	**Function / Use**	**What it does**
=TRIM(A2)	TRIM	Removes extra spaces between words except single spaces.
=CLEAN(A2)	CLEAN	Removes many non-printing characters.
=UPPER(A2)	UPPER	Converts to uppercase.
=LOWER(A2)	LOWER	Converts to lowercase.
=PROPER(A2)	PROPER	Capitalizes each word.
=CONCAT(A2,B2)	CONCAT	Joins text values.
=TEXTJOIN(", ",TRUE,A2:A10)	TEXTJOIN	Joins values with comma-space, ignoring blanks.
=A2&" "&B2	& operator	Joins text with a space.
=FIND("@",A2)	FIND	Case-sensitive position of text.
=SEARCH("excel",A2)	SEARCH	Case-insensitive search position.
=SUBSTITUTE(A2,"old","new")	SUBSTITUTE	Replaces matching text.
=REPLACE(A2,1,3,"ABC")	REPLACE	Replaces characters by position.
=TEXT(A2,"dd-mmm-yyyy")	TEXT	Formats a number/date as text.

=VALUE(A2)	VALUE	Converts number-like text to a number.
=EXACT(A2,B2)	EXACT	Checks whether two text strings match exactly.
=TEXTBEFORE(A2,"-")	TEXTBEFORE	Text before a delimiter; newer Excel.
=TEXTAFTER(A2,"-")	TEXTAFTER	Text after a delimiter; newer Excel.
=TEXTSPLIT(A2,",")	TEXTSPLIT	Splits text using a delimiter; newer Excel.
=REPT("*",5)	REPT	Repeats text 5 times.
=CHAR(65)	CHAR	Returns character for a code.
=CODE(A2)	CODE	Code of the first character.

6. Date & Time

Formula / Example	Function / Use	What it does
=TODAY()	TODAY	Current date; updates with recalculation.
=NOW()	NOW	Current date and time.
=DATE(2026,10,14)	DATE	Builds a date from year, month, day.
=DAY(A2)	DAY	Day of month.
=MONTH(A2)	MONTH	Month number.
=YEAR(A2)	YEAR	Year number.
=HOUR(A2)	HOUR	Hour from a time value.
=MINUTE(A2)	MINUTE	Minute from a time value.
=SECOND(A2)	SECOND	Second from a time value.
=WEEKDAY(A2,2)	WEEKDAY	Monday=1 through Sunday=7.
=WEEKNUM(A2,2)	WEEKNUM	Week number, Monday-based.
=EDATE(A2,3)	EDATE	Date 3 months later.
=EOMONTH(A2,0)	EOMONTH	Last day of the current month.
=DATEDIF(A2,B2,"Y")	DATEDIF	Whole years between dates.
=NETWORKDAYS(A2,B2)	NETWORKDAYS	Working days excluding weekends.
Formula / Example	**Function / Use**	**What it does**
=NETWORKDAYS(A2,B2,H2:H10)	NETWORKDAYS + holidays	Also excludes listed holidays.
=WORKDAY(A2,10)	WORKDAY	Date after 10 working days.
=YEARFRAC(A2,B2)	YEARFRAC	Fraction of a year between dates.

`=DAYS(B2,A2)`	DAYS	Number of days from A2 to B2.

7. Lookup & Reference

Formula / Example	Function / Use	What it does
`=XLOOKUP(E2,A2:A100,B2:B100,"Not found")`	XLOOKUP	Exact-match lookup by default; modern Excel.
`=VLOOKUP(E2,A2:C100,3,FALSE)`	VLOOKUP	Looks in first column; FALSE requests exact match.
`=HLOOKUP(B5,A1:H3,3,FALSE)`	HLOOKUP	Looks across the first row.
`=INDEX(B2:B100,MATCH(E2,A2:A100,0))`	INDEX + MATCH	Flexible lookup; MATCH 0 means exact match.
`=MATCH(E2,A2:A100,0)`	MATCH	Position of exact match.
`=XMATCH(E2,A2:A100)`	XMATCH	Modern position lookup; exact by default.
`=LOOKUP(E2,A2:A100,B2:B100)`	LOOKUP	Approximate lookup; lookup data should be sorted.
`=CHOOSE(2,"Red","Blue","Green")`	CHOOSE	Returns the 2nd listed option.
`=ROW(A5)`	ROW	Row number.
`=COLUMN(C1)`	COLUMN	Column number.
`=ROWS(A1:A10)`	ROWS	Number of rows.
`=COLUMNS(A1:D1)`	COLUMNS	Number of columns.
`=ADDRESS(2,3)`	ADDRESS	Cell address as text.
`=INDIRECT("A"&1)`	INDIRECT	Turns text into a reference; volatile.
`=OFFSET(A1,2,1)`	OFFSET	Reference 2 rows down and 1 column right; volatile.
`=HYPERLINK("https://example.com","Open site")`	HYPERLINK	Creates a clickable link.

8. Dynamic Arrays & Modern Excel

Formula / Example	Function / Use	What it does
`=FILTER(A2:C100,C2:C100="Paid","No results")`	FILTER	Returns rows meeting a condition.
`=SORT(A2:C100,2,1)`	SORT	Sorts by the 2nd column ascending.
`=SORTBY(A2:C100,C2:C100,-1)`	SORTBY	Sorts by a separate range descending.
`=UNIQUE(A2:A100)`	UNIQUE	Returns distinct values.
`=SEQUENCE(10)`	SEQUENCE	Generates 1 to 10.
`=TAKE(A2:C100,5)`	TAKE	First 5 rows.
`=DROP(A2:C100,1)`	DROP	Removes first row.
`=CHOOSECOLS(A2:D100,1,4)`	CHOOSECOLS	Returns columns 1 and 4.

=CHOOSEROWS(A2:D100,1,3)	CHOOSEROWS	Returns rows 1 and 3.
=VSTACK(A2:C10,E2:G10)	VSTACK	Stacks ranges vertically.
=HSTACK(A2:A10,B2:B10)	HSTACK	Combines ranges side by side.

Formula / Example	Function / Use	What it does
=TOCOL(A2:C10)	TOCOL	Flattens range into one column.
=TOROW(A2:C10)	TOROW	Flattens range into one row.
=WRAPROWS(A2:A12,3)	WRAPROWS	Wraps values into 3 columns per row.
=EXPAND(A2:B5,6,4,"-")	EXPAND	Expands array to 6 rows by 4 columns.
=LET(total,SUM(A2:A10),total*10%)	LET	Names a value inside a formula.
=LAMBDA(x,x*2)(A2)	LAMBDA	Creates a reusable calculation; support varies.

9. Conditional Aggregation & Analysis

Formula / Example	Function / Use	What it does
=SUMIF(A2:A100,"East",B2:B100)	SUMIF	Adds B where A equals East.
=SUMIFS(D2:D100,A2:A100,"East",B2:B100,">=100")	SUMIFS	Adds values meeting multiple conditions.
=MAXIFS(C2:C100,A2:A100,"East")	MAXIFS	Maximum where region is East.
=MINIFS(C2:C100,A2:A100,"East")	MINIFS	Minimum where region is East.
=COUNTIFS(A:A,"East",B:B,"Paid")	COUNTIFS	Counts rows matching two conditions.
=SUMPRODUCT(A2:A10,B2:B10)	SUMPRODUCT	Multiplies corresponding values and sums them.
=SUMPRODUCT((A2:A10="East")*(B2:B10))	SUMPRODUCT conditional	Sums B for rows where A is East.
=FREQUENCY(A2:A20,C2:C6)	FREQUENCY	Frequency distribution; may spill in modern Excel.

10. Financial Functions

Formula / Example	Function / Use	What it does
=PMT(8%/12,36,-100000)	PMT	Monthly payment on a 100,000 loan at 8% annual interest for 36 months.
=FV(8%/12,36,-3000)	FV	Future value of monthly contributions; assumptions matter.
=PV(8%/12,36,-3000)	PV	Present value of periodic payments.
=RATE(36,-3200,100000)	RATE	Interest rate per period.
=NPER(8%/12,-3000,100000)	NPER	Number of periods.
=NPV(10%,B2:B6)	NPV	Net present value of future cash flows; initial outlay is usually added separately.

=IRR(B2:B6)	IRR	Internal rate of return for periodic cash flows.
=XIRR(B2:B6,A2:A6)	XIRR	IRR for cash flows on actual dates.
=SLN(100000,10000,5)	SLN	Straight-line depreciation per period.
=DB(100000,10000,5,1)	DB	Fixed-declining balance depreciation for period 1.

11. Information & Error Checking

Formula / Example	Function / Use	What it does
=ISBLANK(A2)	ISBLANK	Checks if cell is empty.
=ISNUMBER(A2)	ISNUMBER	Checks for a number.
=ISTEXT(A2)	ISTEXT	Checks for text.
Formula / Example	**Function / Use**	**What it does**
=ISLOGICAL(A2)	ISLOGICAL	Checks for TRUE/FALSE.
=ISERROR(A2)	ISERROR	Checks for any error.
=ISNA(A2)	ISNA	Checks for #N/A.
=ERROR.TYPE(A2)	ERROR.TYPE	Returns a code for an error value.
=TYPE(A2)	TYPE	Returns a value type code.
=CELL("address",A2)	CELL	Returns information about a cell.
=FORMULATEXT(B2)	FORMULATEXT	Shows the formula in a cell.
=NA()	NA	Returns the #N/A error intentionally.

12. Database Functions

Formula / Example	Function / Use	What it does
=DSUM(A1:D100,"Sales",F1:F2)	DSUM	Adds database field values matching criteria.
=DCOUNT(A1:D100,"Sales",F1:F2)	DCOUNT	Counts numeric values matching criteria.
=DCOUNTA(A1:D100,"Name",F1:F2)	DCOUNTA	Counts non-empty values matching criteria.
=DAVERAGE(A1:D100,"Sales",F1:F2)	DAVERAGE	Averages values matching criteria.
=DMAX(A1:D100,"Sales",F1:F2)	DMAX	Maximum matching database value.
=DMIN(A1:D100,"Sales",F1:F2)	DMIN	Minimum matching database value.

13. Engineering & Conversion

Formula / Example	Function / Use	What it does
=CONVERT(A2,"km","mi")	CONVERT	Converts kilometres to miles; units must be supported.
=DEC2BIN(10)	DEC2BIN	Decimal 10 to binary.

=BIN2DEC("1010")	BIN2DEC	Binary to decimal.
=DEC2HEX(255)	DEC2HEX	Decimal to hexadecimal.
=HEX2DEC("FF")	HEX2DEC	Hexadecimal to decimal.
=COMPLEX(3,4)	COMPLEX	Creates a complex number 3+4i.
=IMABS("3+4i")	IMABS	Magnitude of a complex number.

14. Useful Business Formulas

Formula / Example	Function / Use	What it does
=B2*C2	Revenue / line total	Quantity in B2 × unit price in C2.
=C2*D2	Discount amount	Price in C2 × discount rate in D2.
=C2*(1-D2)	Price after discount	Subtracts percentage discount.
=IF(E2="Paid","Complete","Pending")	Payment status	Labels order by payment status.
=IFERROR((B2-C2)/B2,0)	Profit margin	Profit divided by revenue; format as percentage.
=SUM(B2:B100)	Total	Adds a numeric column.
=B2/$B$100	Share of total	Copy down; B100 is assumed to contain total.
=IF(C2>=TODAY(),"Upcoming","Past")	Date status	Compares a date with today.
=COUNTIF(D2:D100,"*gmail.com")	Text wildcard	Counts text ending in gmail.com.
Formula / Example	**Function / Use**	**What it does**
=SUMIFS(C:C,A:A,">="&F1,A:A,"<="&G1)	Date-range sum	Sums C for dates in A between F1 and G1.
=IF(B2="","",B2*10%)	Blank-safe formula	Leaves result blank when B2 is blank.

15. Data Cleaning & Text Extraction

Formula / Example	Function / Use	What it does
=TRIM(CLEAN(A2))	Clean text	Removes many extra spaces/non-printing characters.
=SUBSTITUTE(A2,CHAR(160)," ")	Nonbreaking spaces	Replaces nonbreaking spaces; combine with TRIM.
=TEXTSPLIT(A2," ")	Split words	Splits text at spaces in modern Excel.
=TEXTBEFORE(A2,"@")	Email username	Text before @.
=TEXTAFTER(A2,"@")	Email domain	Text after @.
=RIGHT(A2,10)	Last 10 characters	Example: extract last 10 characters of a phone string.
=LEN(A2)-LEN(SUBSTITUTE(A2," ",""))+1	Word count (simple)	Counts words separated by single spaces; trim/clean first.
=IFERROR(VALUE(A2),"")	Convert safely	Blank result if text cannot convert to a number.

16. Advanced Formula Patterns

Formula / Example	Function / Use	What it does
`=IFERROR(INDEX(B:B,MATCH(E2,A:A,0)),"Not found")`	Compatible lookup	Alternative to XLOOKUP in older Excel.
`=SUMPRODUCT((A2:A100=E2)*(B2:B100))`	Conditional sum	Sums B where A matches E2.
`=IF(COUNTIF(A:A,A2)>1,"Duplicate","Unique")`	Duplicate check	Flags repeated values.
`=INDEX(A2:A100,MATCH(0,COUNTIF(E1:E1,A2:A100),0))`	Unique extraction (legacy)	Legacy array formula; entry requirements vary by Excel version.
`=IF(AND(A2<>"",B2<>""),A2&" - "&B2,"")`	Conditional text join	Joins only when both cells have values.
`=SUMPRODUCT((A2:A100>=F1)*(A2:A100<=G1)*(B2:B100))`	Between dates/values	Sums B where A is between F1 and G1.
`=IFERROR(SEARCH("urgent",A2)>0,FALSE)`	Keyword detection	TRUE if text contains urgent; case-insensitive.
`=LET(x,A2*B2,x-C2)`	LET pattern	Calculates an intermediate result once.

17. Formula Troubleshooting

Error	Common cause
#DIV/0!	A formula divides by zero or an empty denominator.
#N/A	A lookup cannot find a match, or a value is unavailable.
#VALUE!	A function received an unexpected value type.
#REF!	A cell reference is invalid, often after deleting cells.
#NAME?	Excel does not recognize a function name or text was not quoted.
#SPILL!	A dynamic array cannot spill because cells are blocked.
#NUM!	A numeric calculation or argument is invalid.
####	Often the column is too narrow to display the value.

End of guide • Practice with a copy of your data before using formulas in important reports.

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