

# Excel Formulas Cheat Sheet

## (Intermediate)

### Intermediate Math Formulas

Our Beginner Cheat Sheet covered the most common beginner math functions such as the SUM function. Intermediate users should become familiar with these more complex functions:

- **ABS()** returns the absolute value of a number.
- **SQRT()** returns the square root of a number
- **RAND()** provides a random number between 0 and 1

### Conditional Logic

Intermediate users should also know how to perform math calculations based on multiple conditions using these functions:

- **SUMIFS**(sum\_range, criteria\_range1, criteria1, [...])
- **COUNTIFS**(criteria\_range1, criteria1, [criteria\_range2, criteria2], ...)
- **AVERAGEIFS**(criteria\_range1, criteria1, [criteria\_range2, criteria2], ...)

The functions evaluate the criteria provided and produce a logical value of TRUE or FALSE.

### Intermediate Math Formulas

Aside from basic functions like MIN and MAX, Excel has a wider range of statistical formulas for intermediate users. Here are some of the most useful:

- **MINA** ■ **MAXA** ■ **COUNTA** ■ **COUNTIF**

### MINA And MAXA

- The more commonly used **MIN** and **MAX** functions ignore text values.
- The alternative **MINA** and **MAXA** functions consider both text and numbers when looking for the highest or lowest values. Text values are evaluated as if they were zero.

### COUNTA And COUNTIF

- The **COUNTA** function is used to [count the number of non-empty cells](#) in a range.
- The **COUNTIF** function is less specific in that it is used to count the number of cells within a range that meet a specific condition or criteria.
- You can also use these functions to count the number of distinct values in a column. This video shows how to do so.

[Youtube link](#)

### Excel Formulas For Financial Analysis

There are several formulas you will want to use when performing financial analysis such as forecasting investments:

- **PRODUCT**(number1, [number2...])
- **QUOTIENT**(numerator, denominator)
- **LOG**(number, [base])

### PRODUCT Function

Suppose you want to calculate the future value of an initial investment of \$1,000 (cell B1) at an annual interest rate of 4% (cell B2) after five years (cell B3).

Use the PRODUCT function to calculate the future value with this formula:

**=B1 \* PRODUCT(1 + B2)^B3**

This formula will return the future value of your investment.

### QUOTIENT And LOG Functions

The next step is to calculate how many years it will take for an investment to double in value at the given interest rate.

Use the QUOTIENT function in combination with the LOG function to calculate this as follows:

**=QUOTIENT(LOG(2) / LOG(1 + B2), 1)**

This formula will return 17 with the sample data, indicating that it will take 17 years for the investment to double in value at an annual interest rate of 4%.

### 3 Functions For Investment Scenarios

These are some functions that are suitable for specific financial scenarios. One of them may be exactly what you need:

- **NPV** ■ **ACCRINT** ■ **INTRATE** ■ **PMT** ■ **IRR** ■ **YIELD**

- The **NPV (Net Present Value)** function will calculate the net present value of an investment based on a series of future cash flows based on a discount rate.
- The **ACCRINT** function calculates the accrued interest of a security that pays periodic interest. This is useful for determining the interest earned on a security since the last payment date up to a given settlement date.
- The **INTRATE** function calculates the interest rate for a fully invested security.
- The **PMT** function calculates the total payment on a debt security.
- The **IRR** function provides the internal rate of a return.
- The **YIELD** function provides the yield of a security based on interest rate, face value, and maturity.

### Intermediate Excel Date And Time Formulas

The basic date and time functions in Excel include the **NOW** and **TODAY** functions for the current date. Intermediate users should also know how to extract components from a given date using:

- **DAY**(date) ■ **MONTH**(date) ■ **YEAR**(date)

- The formula **=MONTH("23 April 2023")** will return a result of 4 for the 4th month. Similarly, the DAY and YEAR functions will return 23 and 2023 respectively.

### Intermediate Month Functions

Intermediate users will sometimes deal with adding or [subtracting months to a date](#) and finding the end of a month.

- **EDATE**(start\_date, number\_of\_months)
- **EOMONTH**(start\_date, number\_of\_months)
- For example, the formula **=EDATE("23 April 2023", 2)** will calculate the date two months later.
- The formula **=EOMONTH(23 April 2023", 2)** calculates the end of the month two months later.
- The result is "30 June 2023", which takes into account that there are only thirty days in June. If you specify 3 months, the result will be "31 July 2023".

### Intermediate Week Functions

- You can use a combination of the **SUM** and **WEEKDAY** functions to count the number of whole workdays within a range of dates.
- The **WEEKDAY** function returns the day of the week for a given date. The second parameter determines the numbering system with the default being Sunday to Saturday.
- If you have a series of dates in a cell range of B1:B40, use this formula to calculate the workdays:

**=SUM(--(WEEKDAY(B1:B40,2)>5))**

### Intermediate Time Functions

- The **YEARFRAC** function calculates the fraction of a year between two dates.
- The **TIMEVALUE** function is used to convert a time represented as text into a decimal number representing the proportion of a 24-hour day.
- The result is an Excel serial number where 1 represents a full 24-hour day, 0.5 represents 12 hours, 0.25 represents 6 hours, and so on.
- Suppose you have a time in text format "17:45" in cell A1 and you want to convert it into a [decimal](#) number. This is the formula:  
**=TIMEVALUE(A1)**
- The value 0.74 represents the proportion of the 24-hour day that has passed by at the time of fifteen minutes before six o'clock.
- Take to to change the time cell from a time format to a text format. You may want to format this as a percentage to be clearer.

### Excel Functions For Conditional And Logical Algebra

Conditional and logical functions are essential for decision-making in Excel. The following functions can be combined with the more basic Excel formulas for powerful logic:

- **IF**(condition, value\_if\_true, value\_if\_false)
- **AND**(condition1, condition2, ...)
- **OR**(condition1, condition2, ...)
- **NOT**(condition1, condition2, ...)
- The **IF** function evaluates a condition and returns different values depending on whether the condition is true or false.
- The **AND**, **OR**, and **NOT** functions check which conditions are true and let you make decisions accordingly.

### IF Function

The IF function in Excel checks a condition and returns one result if it's TRUE, and another if it's FALSE.

Syntax: **=IF(logical\_test, value\_if\_true, value\_if\_false)**

For example, **=IF(A1>=60, "Pass", "Fail")** checks if the score in cell A1 is at least 60. If it is, it displays "Pass", otherwise it displays "Fail".

### AND Function

The AND function in Excel checks multiple conditions and returns TRUE if all conditions are met, otherwise it returns FALSE.

Syntax: **=AND(condition1, condition2, ...)**

For example, **=AND(A1>3, A2<20)** checks if the value in A1 is greater than 3 and if the value in A2 is less than 20. If both are true, it returns TRUE; otherwise, it returns FALSE.

### NOT Function

The NOT function in Excel reverses a logical value or condition. It returns FALSE if the input is TRUE, and vice versa.

Syntax: **=NOT(logical\_expression)**

For example, **=NOT(A1)** will return FALSE if the value in cell A1 is TRUE, and TRUE if the value is FALSE.





# Excel Formulas Cheat Sheet

(Intermediate)

## Referencing Cells

A beginner will quickly become familiar with using absolute and relative references such as \$A\$1 or B2. Intermediate users should become familiar with using indirect references, indexes, and offsets:

- **INDIRECT**(ref\_text)
- **INDEX**(range, row\_num, column\_num)
- **OFFSET**(reference\_cell, rows, columns)

## INDIRECT Function

The **INDIRECT** function returns the value of the specified cell reference entered as text. To reference cell B3, use this formula:

**=INDIRECT("B3")**

- The advantage over using simple cell references is that this function gives you a dynamic reference. This means that Excel automatically updates the reference when the structure of the spreadsheet changes e.g. a row is deleted.

## INDEX Function

The **INDEX** function is used to reference cells within a specified range based on row and column numbers.

- To reference cell B3 in a table of six rows, use this formula:  
**=INDEX(B1:B6, 3)**

## OFFSET Function

The **OFFSET** function returns a cell or range that is a specified number of rows and columns away from a reference cell.

- If you want to display the cell value that is two cells across and one cell down from A1, use this formula:  
**=OFFSET(A1, 2, 1)**

## Intermediate Text Formulas

Beginners should know text functions like LEFT, which extracts one or more characters from the left side of a string. A power user should be familiar with functions like these:

- **TEXTJOIN**(delimiter, ignore\_empty, text1, [text2, ...])
- **REPLACE**(old\_text, start\_num, num\_chars, new\_text)
- **OFFSET**(reference\_cell, rows, columns)

## TEXTJOIN Function

The **TEXTJOIN** function concatenates cells with the delimiter that you provide. You can also specify where to ignore blank cells.

To produce a comma-delimited list of some items in column A, use this formula:

**=TEXTJOIN(", ", TRUE, A2:A4)**

## SUBSTITUTE Function

The substitute function replaces specified occurrences of a text string within another text string with a new text string.

To replace occurrences of the word "Jeans" with "Leggings", use this formula:

**=SUBSTITUTE(A3, "Jeans", "Leggings")**

## Intermediate Lookup Formulas

Common lookup functions like **VLOOKUP** and **MATCH** are covered in the beginner's cheat sheet.

- Intermediate users should get familiar with the **CHOOSE** lookup function:  
**CHOOSE(index\_num, value1, [value2, ...])**
- The **CHOOSE** function returns a value from a list of values based on a specified index number.
- Suppose you have a column of t-shirt sizes labelled as 1, 2, or 3. You want to display a category of small, medium, and large respectively in the same row. Use this formula:  
**=CHOOSE(A1, "Small", "Medium", "Large")**

## Formulas For Handling Microsoft Excel Errors

The beginner cheatsheet listed the typical error messages you will see when working with Excel. Intermediate users should be able to use formulas to handle the errors gracefully.

- **IFERROR**(value, if\_error)
- **IFNA**(value, value\_if\_na)

## IFERROR Function

Division by **zero** errors are common but Excel's default display of **#DIV/0!** won't be clear to every user.

Use the **IFERROR** function to replace the standard error with "Cannot divide by zero" with this formula:

**=IFERROR(A1/B1, "Cannot divide by zero")**

## IFNA Function

- The **IFNA** function in Excel is used to catch and handle **#N/A** errors.
- Another section of this cheat sheet showed the **CHOOSE** function. This function will return a **N/A** error if the index number is not an integer.
- Suppose a t-shirt size has been entered as 1.5, with the user mistakenly thinking that this will show a category somewhere between small and medium. Instead, it will show a **#N/A** error.
- To provide a more helpful error, use this formula:  
**=IFNA(CHOOSE(A2, "Low", "Medium", "High"), "Invalid index")**

## Formula And Function Shortcuts

There are several keyboard shortcuts that can make you work more efficiently with your worksheet.

- **F2**: Edit the active cell and position the insertion point at the end of the cell contents.
- **F9**: Calculate and display the result of the selected portion of a formula.
- **Ctrl + Shift + Enter**: Enter an array formula.
- **Shift + F3**: Open the Insert Function dialog box.
- **Esc**: Cancel the entry of a formula and revert to the original cell contents.

Some of these Excel shortcuts might not be available in all languages or keyboard layouts.

## Intermediate Cell Formatting

In financial analysis, proper formatting for cells containing numbers, dates, and currencies is crucial. To format cells, follow these steps:

1. Select the cells you want to format.
2. Right-click on the selected cells and choose "Format Cells."
3. Select the appropriate category (e.g., Number, Currency, Date) and apply the desired format.

Some common formatting types to consider in finance include:

- Currency: \$1,234.56
- Percentage: 12.34%
- Accounting: (\$1,234.00)
- Date: 10-May-2023

## Conclusion

- As you become more comfortable with the various formulas and functions highlighted in this cheat sheet, you'll find yourself better equipped to handle increasingly complex tasks and projects.
- Practice is key to mastering any skill, so don't be afraid to experiment with these formulas in your day-to-day work. They will bring your expertise from beginner level to intermediate level.
- By consistently leveraging these intermediate-level functions, you'll not only enhance your productivity but also unlock new insights and efficiencies in your data analysis.

