Here are most of the functions we covered last week and this week. Please allocate some time to give over the definition and the examples and let me know if you have any questions related to any function.

**✅ 1. IF Condition & Nested IF**

**IF** checks whether a condition is true or false.

**Syntax:**

=IF(condition, value\_if\_true, value\_if\_false)

**Example:**

=IF(A1>70, "Pass", "Fail")

**Nested IF** lets you check multiple conditions:

=IF(A1>90, "A", IF(A1>80, "B", IF(A1>70, "C", "F")))

**🔄 2. IFS Function**

Simplifies multiple conditions without nesting.

**Syntax:**

=IFS(condition1, result1, condition2, result2, ...)

**Example:**

=IFS(A1>90, "A", A1>80, "B", A1>70, "C", A1<=70, "F")

**🔢 3. COUNTIF**

Counts how many cells meet a single condition.

**Syntax:**

=COUNTIF(range, criteria)

**Example:**

=COUNTIF(B2:B10, ">80")

**🔢🔢 4. COUNTIFS**

Counts cells that meet **multiple** conditions.

**Syntax:**

=COUNTIFS(range1, criteria1, range2, criteria2, ...)

**Example:**

=COUNTIFS(A2:A10, "Math", B2:B10, ">80")

**➕ 5. SUMIF**

Adds values that meet a single condition.

**Syntax:**

=SUMIF(range, criteria, [sum\_range])

**Example:**

=SUMIF(A2:A10, "Math", B2:B10)

**➕➕ 6. SUMIFS**

Adds values that meet **multiple** conditions.

**Syntax:**

=SUMIFS(sum\_range, range1, criteria1, range2, criteria2, ...)

**Example:**

=SUMIFS(C2:C10, A2:A10, "Math", B2:B10, ">80")

**🔗 7. Using AND / OR in IF**

Use AND or OR to combine conditions inside IF.

**Example with AND:**

=IF(AND(A1>70, B1>70), "Pass", "Fail")

**Example with OR:**

=IF(OR(A1>70, B1>70), "Pass", "Fail")

**🔍 8. VLOOKUP**

Searches for a value **vertically** in the first column of a table.

**Syntax:**

=VLOOKUP(lookup\_value, table\_array, col\_index\_num, [range\_lookup])

**Example:**

=VLOOKUP("John", A2:C10, 2, FALSE)

**🔍 9. HLOOKUP**

Searches for a value **horizontally** in the first row of a table.

**Syntax:**

=HLOOKUP(lookup\_value, table\_array, row\_index\_num, [range\_lookup])

**Example:**

=HLOOKUP("Q1", A1:D3, 2, FALSE)

**📌 10. INDEX**

Returns the value at a specific row and column in a range.

**Syntax:**

=INDEX(array, row\_num, [column\_num])

**Example:**

=INDEX(A2:C5, 2, 3) → returns value in 2nd row, 3rd column

**🔍 11. MATCH & XMATCH**

**MATCH** returns the position of a value in a range.

**Syntax:**

=MATCH(lookup\_value, lookup\_array, [match\_type])

**Example:**

=MATCH(80, B2:B10, 0)

**XMATCH** is a more powerful version (Excel 365+), works with vertical/horizontal arrays and supports exact/approximate matches.

**Syntax:**

=XMATCH(lookup\_value, lookup\_array, [match\_mode], [search\_mode])

**🔮 12. What-If Analysis**

A set of tools to explore different outcomes by changing input values.

**Types:**

* **Scenario Manager**: Save and switch between different sets of inputs.
* **Goal Seek**: Find the input needed to reach a desired result.
* **Data Tables**: See how changing one or two variables affects results.

**Example (Goal Seek):** You want a formula to return 100. Use Goal Seek to find what input value makes that happen.

Let me know if you'd like this as a downloadable cheat sheet or want to try some practice problems!