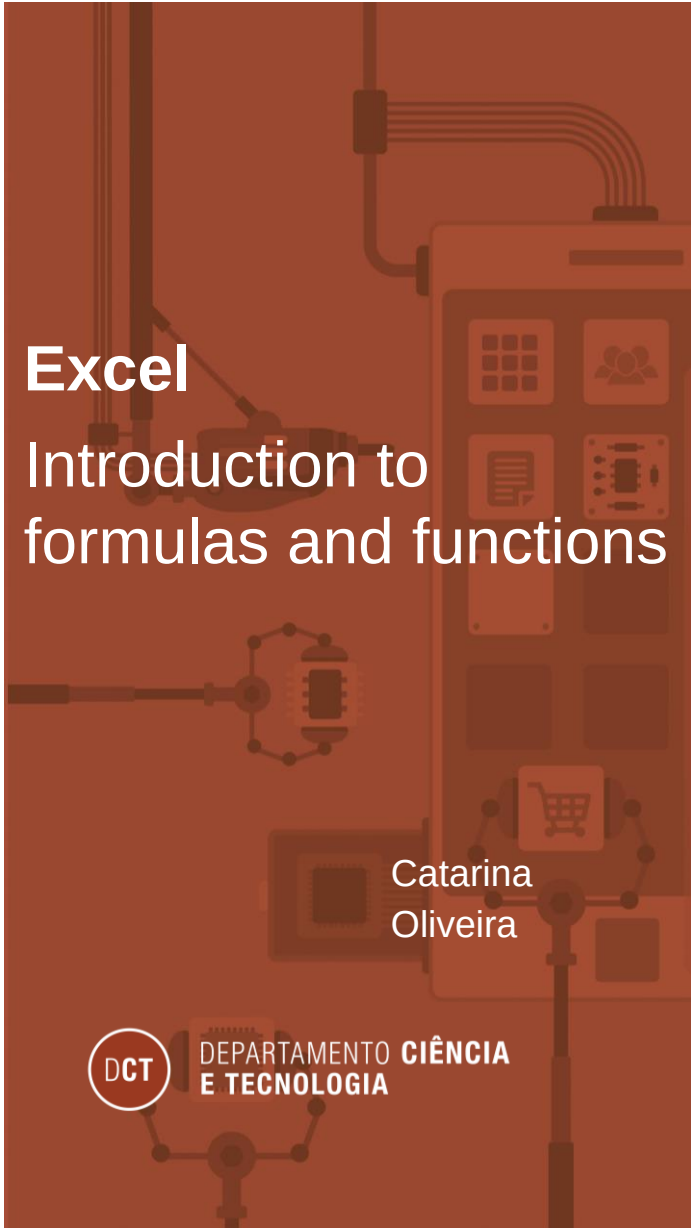

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CONTENT

1. Formula
2. Operators
    1. Arithmetic
    2. Comparison
    3. Reference
3. References
    1. Relative
    2. Mixed and Absolute
    3. By name
4. Functions
    1. Insert functions
5. Errors in formulas and functions

Formula

- Expression
- Inserted into a certain cell
  - Insert “=“ in the begining
- Automatically calculated
  - From values inserted in the formula and/or in other cells
- Processed from left to right
  - According to the precedence:
    1. :
    2. [space]
    3. ;
    4. -
    5. %
    6. ^
    7. *, /
    8. +, -
    9. &
    10. =, <, >, <=, >=, <>

- Composed by:
  - Values
  - Operators:
    - Arithmetic **[slide 4]**
    - Comparison **[slide 5]**
    - Reference **[slide 6]**
    - Text:
      - operator & - concatenation (ex: “Informática “&”Aplicada” → “Informática Aplicada”
  - References
  - Functions
- Examples
  - Math operations
  - Value comparison
  - Text concatenation
  - Complex operations with functions

Arithmetic Operators

Operator	Meaning
^	Exponential (ex: 3^2 = 3^2)
%	Percentage (ex: 1%)
*	Multiplication
/	Division
+	Sum
-	Subtractions or Negative

Comparison Operators

Operator	Meaning
=	Equals
>	Greater than
<	Less than
>=	Greater or equal to
<=	Less or equal to
<>	Different

Reference Operators

Operator	Meaning
:	Cell range (ex: A1:B3)
;	Combines several isolated references (ex: A1:A3; C1:C3) Separes arguments in a function.
[space]	Intersection of cell ranges (ex: A1:B2 A2:C3 → Intersection: A2; B2)

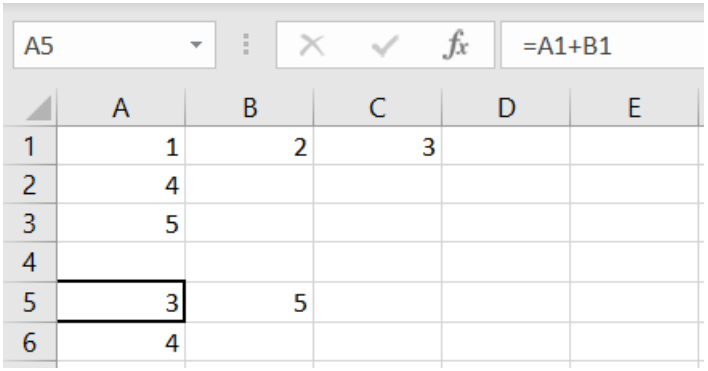
References

- Identifiers of a cell or range
- Objective: set the location of the data needed for a formula or function
- Types:
  - Relative **[slide 8]**
  - Absolute **[slide 9]**
  - Mixed **[slide 9]**
  - By name **[slide 10]**
  - External
    - Reference to the cell (or range) in other sheets or books
    - Cell in another sheet of the same book: **sheet!cell**
      - Ex: Sheet1!$A$1 → cell $A$1 on Sheet1 of the current file
    - Cell in a sheet of another book: **path[file_name]sheet!cell**
      - Ex: C:\Files\[File1.xlsx]Sheet1!$A$1 → cell $A$1 of the sheet Sheet1 on file File1.xlsx saved on C:\Files
  - Circular
    - ERROR → wrong results
    - Example: cell A1 depends on the result of cell B1 and cell B1 depends on the result of A1

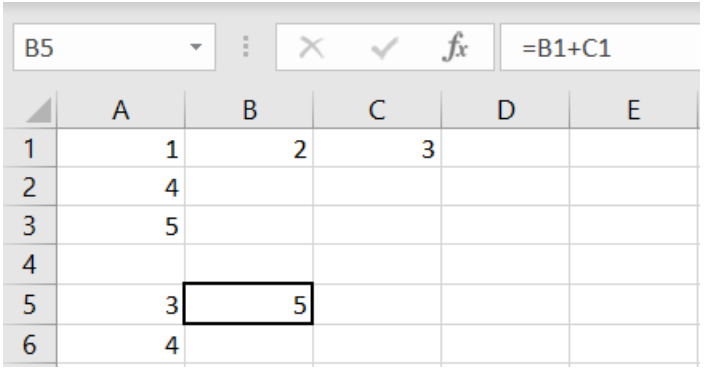
Relative References

Default references

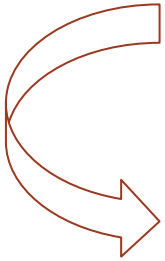
Based on the relative position of the cells

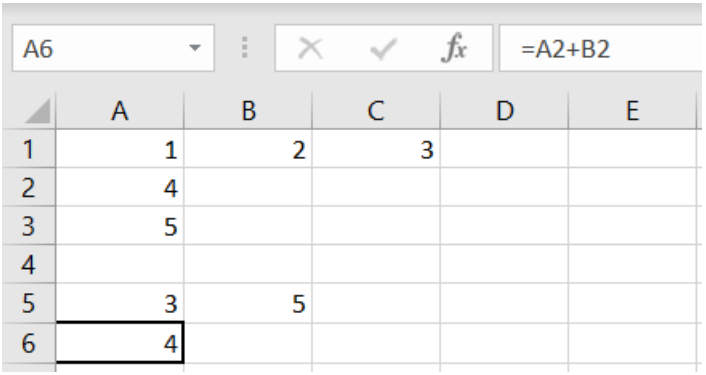


Drag right



Drag down

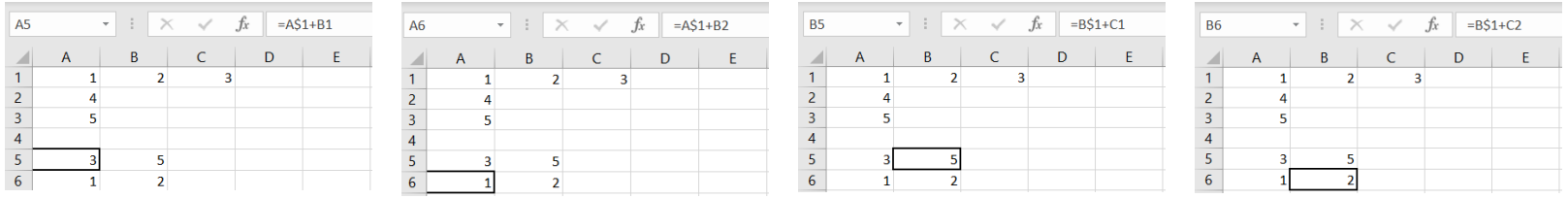




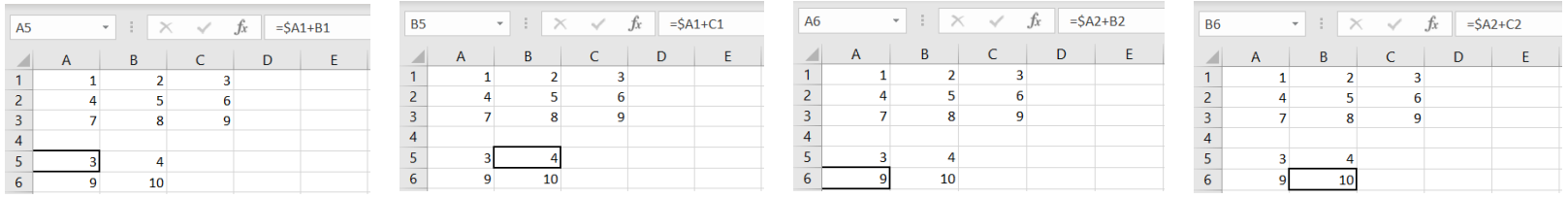
Mixed and Absolute References

Use the character “$”

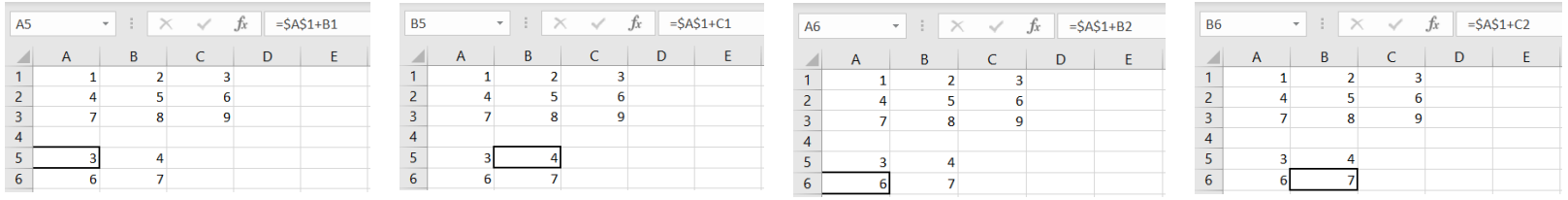
- **Mixed references:** Pin rows (ex: A$1)



- **Mixed references:** Pin columns (ex: $A1)



- **Absolute references:** Pin rows and columns (ex:$A$1)

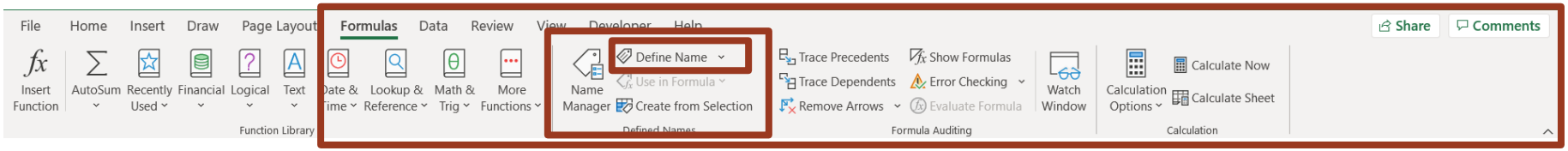


Named references

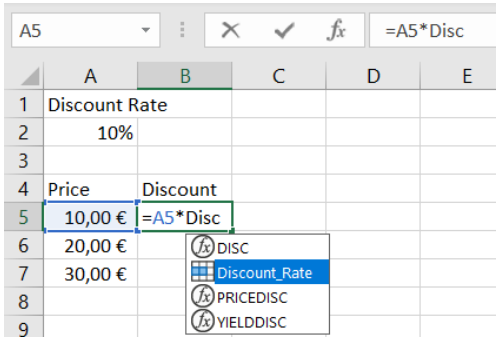
Consists in giving a name to a cell (or range)

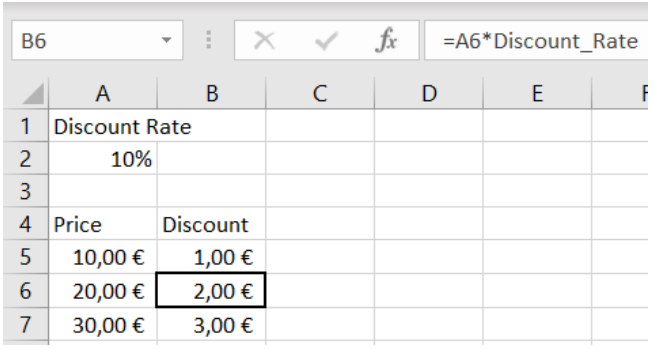
It's an absolute reference

Define the name: select the cells and click:



Use:



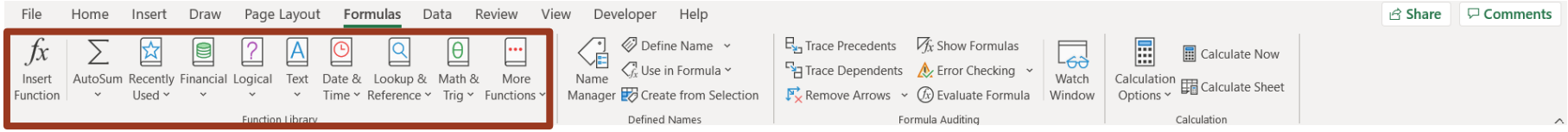


Functions

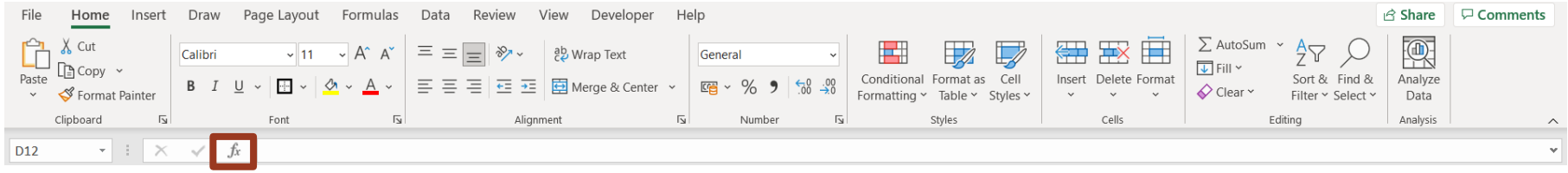
- Predefined formulas
- Use values as arguments
    - Arguments can be:
        - Numbers
        - Text
        - Logical values (TRUE, FALSE)
        - Dates
        - Matrixes (cell ranges)
        - Error values
        - Cell references
        - Formulas
        - Other functions
- Usually return one value
    - Some functions return several values
- Nested functions:
    - Functions that use one or more functions as arguments

Insert functions

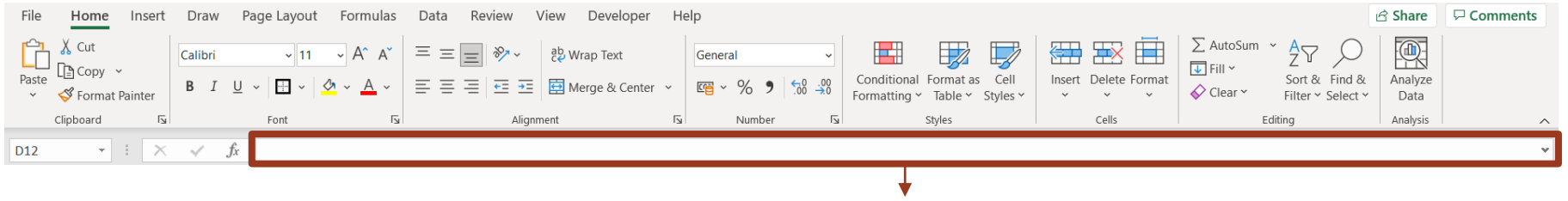
Select:



Button “insert formula”:



Write on the formula bar



Structure: function_name(argument1; argument2; …)

Errors in formulas and functions

Error	Meaning
#########	Date/time with negative value Column to small for the content
#NULL!	A non-intersecting intersection was specified
#DIV/0!	Division by 0
#VALUE!	Wrong type of argument
#REF!	Invalid cell reference
#NAME?	Unrecognized text
#NUM!	Problem with a number
#N/A **#N/D**	Value not available

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Do conhecimento à prática.