Excel Formulas and Functions

This Guide will teach you how to work with math functions and formulas.

Math and more…

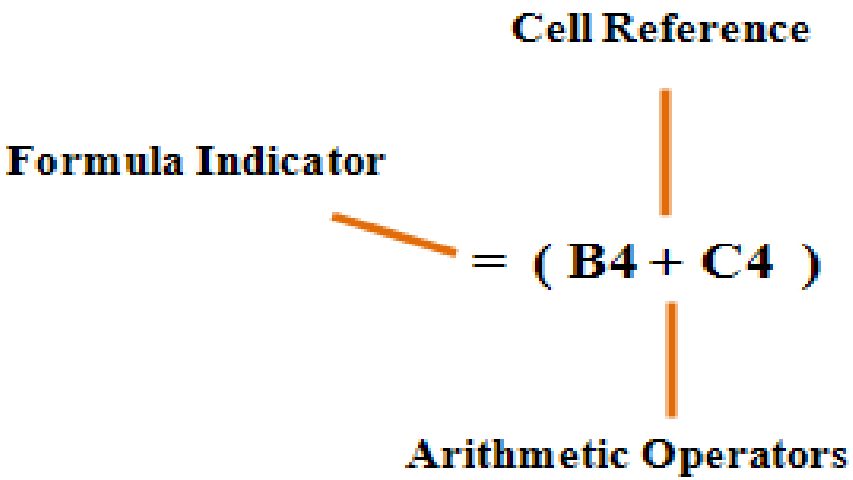
You can use formulas to:

- Solve mathematical problems
- Complete statistical and financial functions
- Return numerical and text values based on other cells
- Add and format text in cells

Formula

- Mathematical Equation
- All formulas begin with an equal (=) sign
- Data that is stored in the worksheet and that needs to be used in a formula is referenced using the cell's address
- =A1+A2/(A3-A4)

An example of a simple formula

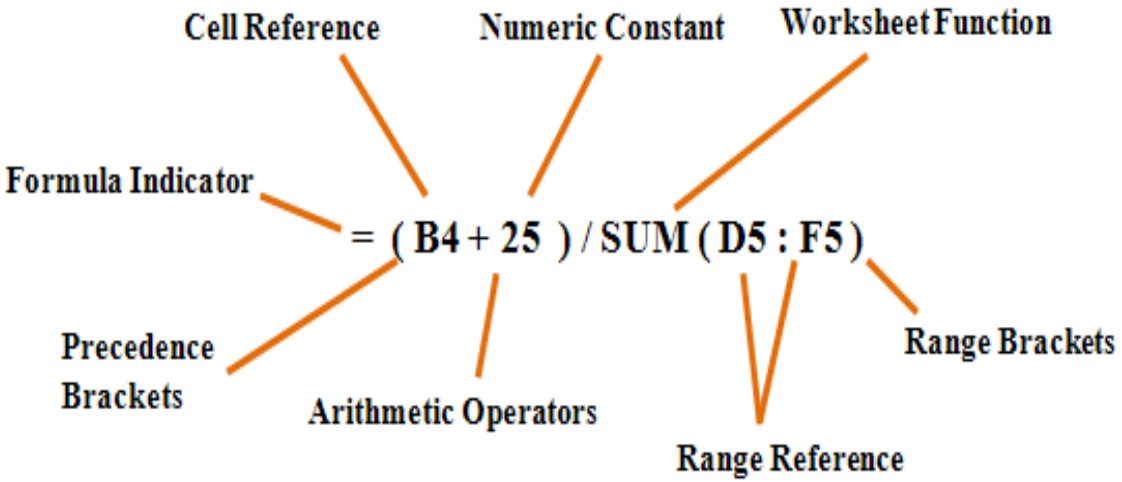


Functions

- A predefined formula

  Formula: =A1+A2+A3+A4+A5
  Function: =SUM(A1:A5)

An example of a more complex formula



What makes a formula?

=(3*A2*SUM(A3:A9))^1/3

- Begin with =
- Constants
- Cell References
- Operators
- Functions

Constants

- Values entered directly into a formula
  - Simple
  - Accurate
  - Inflexible

2, 3, 12, 14.32

References

- Relative (Column Row)

  A1, C18, ZZ65536
- Absolute ($Column$Row)

  A1, C18,ZZ65536
- Mixed (Fixed Column or Row)

  $A1, C$18
- Named Ranges

  Int_Rate, Grade_Scale

Operators

- Arithmetic

  - (negative) % ^ (Exponent) * / +
- Comparison

  = < > <= >= <>
- Text

  &
- Reference

  : (Colon) _ (Space) , (Comma)

Operator Order

Formulas are read from Left to Right

1. ( )
2. Negation
3. %
4. ^
5. * or /
6. + or –
7. &
8. = < > <= >= <>

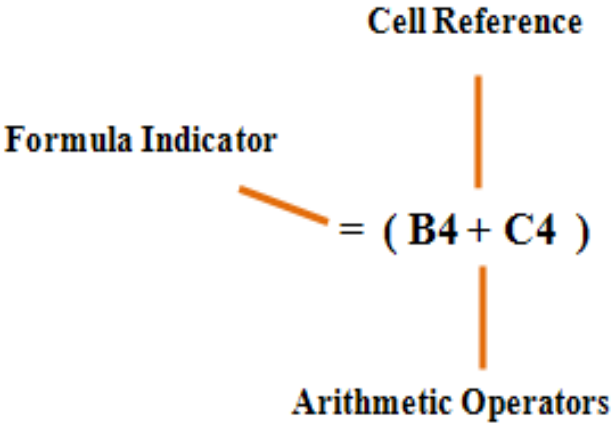
Error Messages (Cell Reference)

##########	Column not wide enough
#VALUE!	Wrong Argument or Reference
#DIV/0!	Dividing by zero
#Name?	Excel doesn’t recognize text in formula
#N/A!	Missing data or wrong value for lookup function
#REF	Cell reference not valid (Deleted cell, pasted over)
#NUM!	Invalid numeric value
#NULL!	Specified cells do not intersect

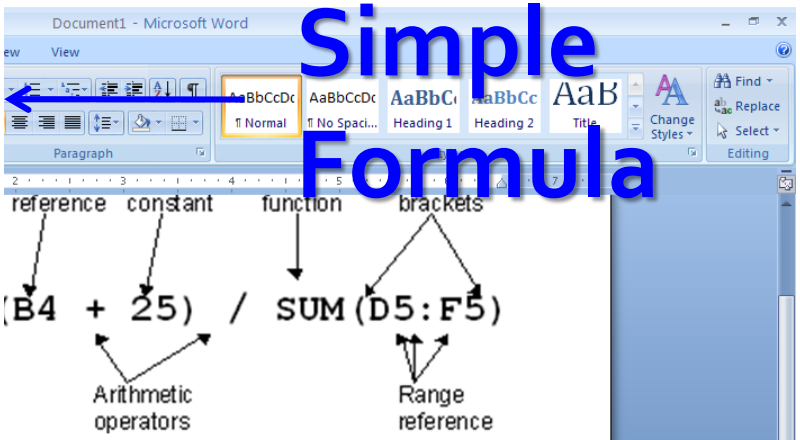
How to Copy Formulas?

- **AutoFill** is a command you can use when you want to copy the same formula across a range of adjacent cells.
- AutoFill will automatically change cell addresses depending on where the new formula is being copied.

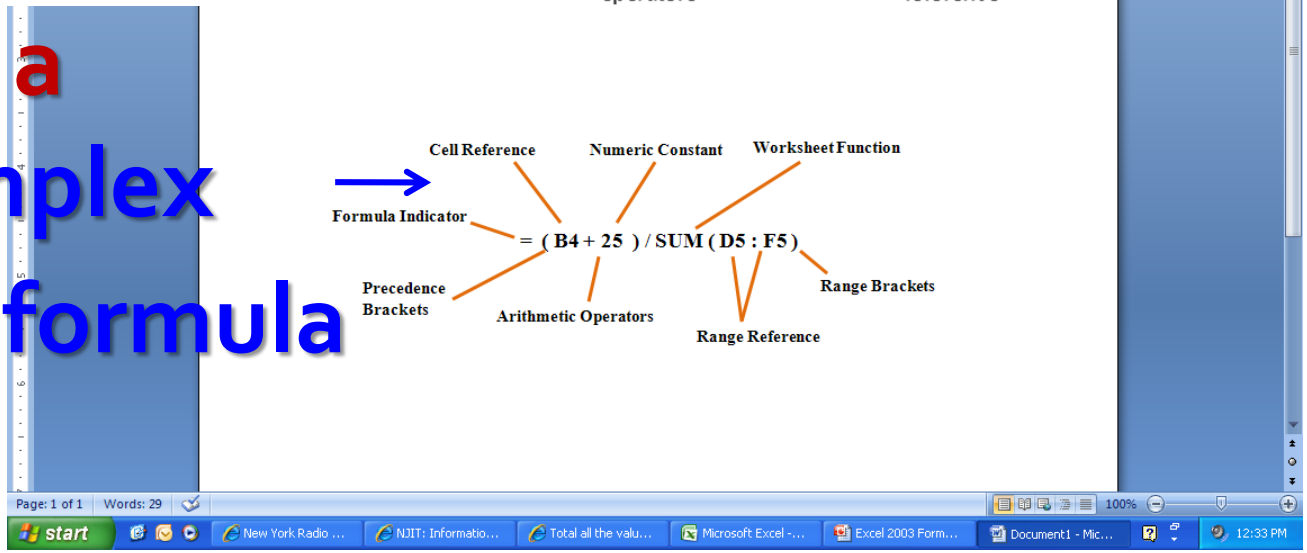
An example of a



Simple Formula



and a Complex formula



Category	Function	Use To
Math & Trig	SUM()	Total all numbers in range or in a list of values. Text has a value of 0 (zero).
Statistical	COUNT()	Count how many numbers there are in a range. Blank cells and text not included.
	AVERAGE()	**SUM** values in a range and **divide by COUNT** of values in the range. Blank cells and text not included.
	MAX()	Find the largest value in range. Blank cells and text not included.
	MIN()	Find the smallest value in range. Blank cells and text not included.
Date & Time	DATE (yyyy,m,d)	Calculate with a date value. Enter the date in the format shown.
	NOW()	Find (and display) the current date and time.
	TODAY()	Find (and display) the current date.

Open Excel worksheet and enter the data below:

SalesRep	Month	Amount
Jones	Jan	100
Jones	Jan	225
Rogers	Jan	400
Rogers	Jan	150
Rogers	Jan	250
Franklin	Jan	800
Franklin	Feb	200
Jones	Feb	350
Franklin	Feb	1200
Rogers	Feb	900
Franklin	Feb	750
Jones	Feb	800
Sum:		
Average:		
Count:		

Add values

- Within a certain range:

  =SUM(C2:C13)
- For an entire range:

  =SUM(C:C) Note: Insert this function in another column.

Count values

- Count values in a range and it the entire range:

  =COUNT(C2:C13)

  =COUNT(C:C)

- Conditional Counting:

  =COUNTIF(A2:A13, "Jones") **or**

  =COUNTIF(A2:A13, "=Jones") – equal

  =COUNTIF(A2:A13, "<> Jones") – not equal

Cont…

- Count the Number of Sales Greater than a Target Value:

  =COUNTIF(C2:C13, ">"&D1)

  Note: the concatenation operator (&) is used to join the grater than symbol (>) with the cell reference.
- Count the Number of Sales Greater than the Sales Average:

  =COUNTIF(C2:C13, ">"&AVERAGE(C2:C13))

Conditional Summing

- Formula that adds all the sales in January:

  =SUMIF(B2:B13, "=Jan", C2:C13)
- Add up sales made by other sales representative:

  =SUMIF(A2:A13, "<> Rogers", C2:C13)
- Add up the sales greater than a certain value:

  =SUMIF(C2:C13, ">500",C2:C13)

Using the IF Function

- Display a value that depends on criteria you set
- Returns a value if one condition is true and returns another value if the condition is false

=IF(logical_test,value_if_true,value_if_false)

PMT function

- Function used to calculate a loan payment amount using principal, interest rate and number of payment periods.

=PMT(rate, nper,pv)

=PMT(.09/12,4*12,24000)

Calculating time period

- Each day, month, and year is given a particular numerical value or serial number by your computer.
- Your computer will work from 1900 date system or 1904 date system
- 1900 date system: Jan 1, 1900 –Dec 31, 9999
- 1904 date system: Jan 2, 1904 – Dec31, 9999
- To check go to **Tools – Options – Calculation**

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