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Microsoft Excel – Formulas

Mathematical Functions

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Mathematical Functions

The Excel Math Functions perform many of the common mathematical calculations, including basic arithmetic, conditional sums & products, exponents & logarithms, and the trigonometric ratios.

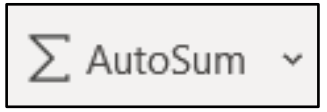
- The Excel **SUM** function adds together a supplied set of numbers and returns the sum of these values.

```
=SUM( number1, [number2], ... )
```

where the number arguments are a set (or arrays) of numbers you want to sum up.

If you get an error from the Excel Sum Function, this is likely to be the #VALUE! Error (arguments not be interpreted as numeric values).

You might also use the Excel **AutoSum** to automatically make an appropriate SUM formula.



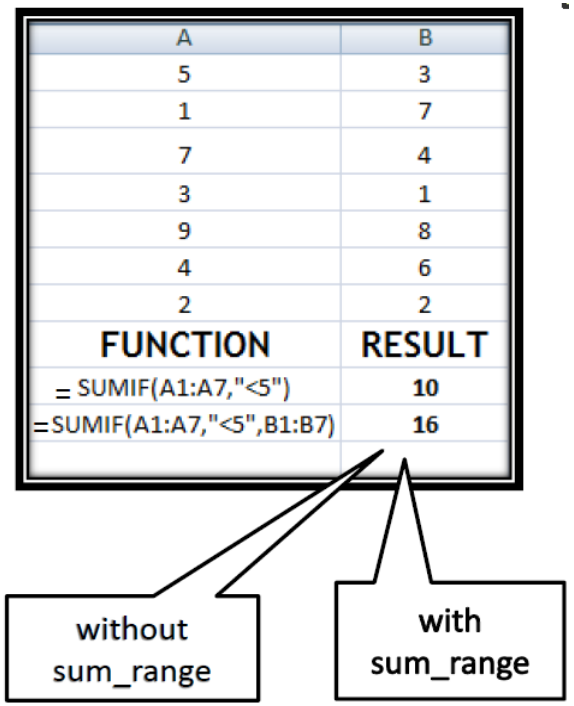
Mathematical Functions

- The Excel **SUMIF** function finds the values in a supplied array, that satisfy a given criteria, and returns the sum of the corresponding values in a second supplied array.

```
=SUMIF( range, criteria, [sum_range] )
```

where the function arguments are:

- Range - An array of values to be tested against the supplied criteria.
- Criteria - The condition to be tested against each of the values in the supplied range.
- [sum_range] – An array of numeric values, which are to be added together, if the corresponding range entry satisfies the supplied criteria.



Mathematical Functions

- The **EXP** function returns values of the exponential function.

```
=EXP(number)
```

For example: Exp(1) returns value of e, and Exp(2) returns value of e^2

Example of use in finance: cash flows occurring at different time periods are converted into future values by applying compounding factors.

- The **SQRT** function returns the positive square root of the value x.

```
=SQRT(number)
```

x must be positive, otherwise the function returns #NUM! for numeric overflow.

The nth root of the value x can be calculated by raising that value the power of 1/n.

Mathematical Functions

- The **LN** function returns the natural logarithm of a number.

```
=LN(number)
```

Note that the values must be positive, otherwise the function returns #NUM! for numeric overflow. E.g.:

- LN(0.36788) returns value -1
- LN(2.7138) returns value 1
- LN(-4) returns value #NUM!

In finance, we frequently work with natural log returns to transform the returns data into log returns.

- The **ABS** function returns the absolute value of any supplied number.

```
=ABS(number)
```

Mathematical Functions

- The **ROUND** function rounds a supplied number up or down, to a specified number of decimal places.

```
=ROUND(number, num_digits)
```

  - If Digit = 0, then Number is rounded to nearest integer;
  - If Digit > 0, then Number is rounded to the specified number of decimal places;
  - If Digit < 0, then Number is rounded to the specified number of digits left of the decimal place.

- These functions work the same way as ROUND, but the direction of rounding is specified by the function.

```
= ROUNDUP(number, num_digits)
```

```
= ROUNDDOWN(number, num_digits)
```