

# LN Function

Computes the natural logarithm of an input value. The value can be a Decimal or Integer literal or a reference to a column containing numeric values.

- The **natural logarithm** of a value is the value of  $e^x$  such that  $x$  is the input value.

**Wrangle vs. SQL:** This function is part of Wrangle, a proprietary data transformation language. Wrangle is not SQL. For more information, see *Wrangle Language*.

## Basic Usage

### Numeric literal example:

```
ln(10)
```

**Output:** Returns the value  $X$ , such that  $e^X$  is 10. This value is approximately 2.302585092994046.

### Column reference example:

```
ln(MyValue)
```

**Output:** Returns the power to which  $e$  is raised to yield the value in the `MyValue` column.

## Syntax and Arguments

```
ln(numeric_value)
```

Argument	Required?	Data Type	Description
numeric_value	Y	string, decimal, or integer	Name of column or Decimal or Integer literal to apply to the function

For more information on syntax standards, see *Language Documentation Syntax Notes*.

### numeric\_value

Name of the column or numeric literal, the natural logarithm of which is to be computed.

- Missing input values generate missing results.
- Literal numeric values should not be quoted. Quoted values are treated as strings.
- Multiple columns and wildcards are not supported.

### Usage Notes:

Required?	Data Type	Example Value
Yes	String (column reference) or Integer or Decimal literal	10

## Examples

**Tip:** For additional examples, see *Common Tasks*.

## Example - Exponential Functions

The following example demonstrates how the exponential functions work together. These functions include the following:

- **EXP** -  $e^x$ . See *EXP Function*.
- **LN** - natural logarithm of the above. See *LN Function*.
- **LOG** -  $10^x$ . See *LOG Function*.
- **POW** -  $X^Y$ . The value X raised to the power Y. See *POW Function*.

### Source:

rowNum	X
1	-2
2	1
3	0
4	1
5	2
6	3
7	4
8	5

### Transformation:

<b>Transformation Name</b>	New formula
<b>Parameter: Formula type</b>	Single row formula
<b>Parameter: Formula</b>	EXP (X)
<b>Parameter: New column name</b>	'expX'

<b>Transformation Name</b>	New formula
<b>Parameter: Formula type</b>	Single row formula
<b>Parameter: Formula</b>	LN (expX)
<b>Parameter: New column name</b>	'ln_expX'

<b>Transformation Name</b>	New formula
<b>Parameter: Formula type</b>	Single row formula
<b>Parameter: Formula</b>	LOG (X)
<b>Parameter: New column name</b>	'logX'

<b>Transformation Name</b>	New formula
<b>Parameter: Formula type</b>	Single row formula
<b>Parameter: Formula</b>	POW (10,logX)
<b>Parameter: New column name</b>	'pow_logX'

**Results:**

In the following, (null value) indicates that a null value is generated for the computation.

rowNum	X	expX	ln_expX	logX	pow_logX
1	-2	0.1353352832366127	-2	(null value)	(null value)
2	-1	0.1353352832366127	-0.9999999999999998	(null value)	(null value)
3	0	1	0	(null value)	0
4	1	2.718281828459045	1	0	1
5	2	7.3890560989306495	2	0.30102999566398114	1.9999999999999998
6	3	20.085536923187668	3	0.47712125471966244	3
7	4	54.59815003314423	4	0.6020599913279623	3.999999999999999
8	5	148.41315910257657	5	0.6989700043360187	4.999999999999999