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 is the input value.

Basic Usage

Numeric literal example:

```
derive type:single value: LN(10)
```

Output: Generates a column containing the value X, such that e^x, is 10. This value is approximately `2.302585092994046`.

Column reference example:

```
derive type:single value: LN(MyValue) as: 'ln_MyValue'
```

Output: Generates the new `ln_MyValue` column containing the power to which *e* is raised to yield the value in the `MyValue` column.

Syntax and Arguments

```
derive type:single value: 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

Transform:

```
derive type:single value: EXP (X) as: 'expX'
```

```
derive type:single value: LN (expX) as: 'ln_expX'
```

```
derive type:single value: LOG (X) as: 'logX'
```

```
derive type:single value: POW (10,logX) as: '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