

# LOG Function

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Computes the logarithm of the first argument with a base of the second argument.

- First argument can be a Decimal or Integer literal or a reference to a column containing numeric values.
- Second argument, the base, must be an Integer value or column reference.

## Basic Usage

### Numeric literal example:

```
derive type:single value: LOG(49, 7)
```

**Output:** Generates a column containing the value of  $7^x = 49$ , which evaluates to 2.

### Column reference example:

```
derive type:single value: LOG(MyValue, 5) as: 'log_MyValue'
```

**Output:** Generates the new `log_MyValue` column containing the exponent that raises 5 to yield the `MyValue` column.

## Syntax and Arguments

```
derive type:single value: LOG(result_numeric_value, base_numeric_value)
```

Argument	Required?	Data Type	Description
result_numeric_value	Y	string, decimal, or integer	Name of column or Decimal or Integer literal that is generated by the LOG function
base_numeric_value	Y	string, decimal, or integer	Name of column or Decimal or Integer literal that serves as the base for computing the LOG function

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

### result\_numeric\_value

Name of the column or numeric literal. Value must be greater than 0.

- 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	49

**base\_numeric\_value**

Name of the column or Integer literal that is used for the exponential calculation.

**NOTE:** This base value must be a positive integer. If this value is not specified, 10 is used as the base value.

- 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
No	String (column reference) or Integer or Decimal literal	7

**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