

# ACOS Function

For input values between -1 and 1 inclusive, this function returns the angle in radians whose cosine value is the input. This function is the inverse of the cosine function. The value can be a Decimal or Integer literal or a reference to a column containing numeric values.

**NOTE:** While this function returns values outside of the range  $-1 \leq x \leq 1$ , those values are not considered valid.

For more information on the cosine function, see *COS Function*.

## Arc secant:

The arc secant function is computed as follows:

Input Range	Output computation
$x \leq -1$	$\text{acos}(1/x)$
$x \geq 1$	$\text{acos}(1/x)$
$-1 < x < 1$	Not valid

**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:

```
acos(0.5)
```

**Output:** Returns the computation of the arc cosine of 0.5. Output value is in radians.

### Column reference example:

```
acos(X)
```

**Output:** Returns the arc cosine of the values in `x` column.

## Syntax and Arguments

```
acos(numeric_value)
```

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

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

### numeric\_value

Name of the column, Integer or Decimal literal, or function returning that data type to apply to the function.

- 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	0 . 5

**Examples**

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

**Example - Trigonometry Arc functions**

This example illustrates how to apply the inverse trigonometric (Arc) functions to your transformations.

**NOTE:** These functions are valid over specific ranges.

- **Arcsine.** See *ASIN Function*.
- **Arccosine.** See *ACOS Function*
- **Arctangent.** See *ATAN Function*.
- **Arccotangent.** Computed using ATAN function. See below.
- **Arcsecant.** Computed using ACOS function. See below.
- **Arccosecant.** Computed using ASIN function. See below.

**Source:**

In the following sample, input values are in radians. In this example, all values are rounded to two decimals for clarity.

Y
-1.00
-0.75
-0.50
0.00
0.50
0.75
1.00

**Transformation:**

Arcsine:

Valid over the range (-1 <= Y <= 1)

Transformation Name	New formula

<b>Parameter: Formula type</b>	Single row formula
<b>Parameter: Formula</b>	<code>round(degrees(asin(Y)), 2)</code>
<b>Parameter: New column name</b>	'asinY'

Arccosine:

Valid over the range  $(-1 \leq Y \leq 1)$

<b>Transformation Name</b>	New formula
<b>Parameter: Formula type</b>	Single row formula
<b>Parameter: Formula</b>	<code>round(degrees(acos(Y)), 2)</code>
<b>Parameter: New column name</b>	'acosY'

Arctangent:

Valid over the range  $(-1 \leq Y \leq 1)$

<b>Transformation Name</b>	New formula
<b>Parameter: Formula type</b>	Single row formula
<b>Parameter: Formula</b>	<code>round(degrees(atan(Y)), 2)</code>
<b>Parameter: New column name</b>	'atanY'

Arccosecant:

This function is valid over a set of ranged inputs, so you can use a conditional column for the computation. For more information, see *ASIN Function*.

<b>Transformation Name</b>	Conditional column
<b>Parameter: Condition type</b>	if...then...else
<b>Parameter: If</b>	<code>(Y &lt;= -1)    (Y &gt;= 1)</code>
<b>Parameter: Then</b>	<code>round(degrees(asin(divide(1, Y))), 2)</code>
<b>Parameter: New column name</b>	'acscY'

Arcsecant:

Same set of ranged inputs apply to this function. For more information, see *ACOS Function*.

<b>Transformation Name</b>	Conditional column
<b>Parameter: Condition type</b>	if...then...else
<b>Parameter: If</b>	<code>(Y &lt;= -1)    (Y &gt;= 1)</code>
<b>Parameter: Then</b>	<code>round(degrees(acos(divide(1, Y))), 2)</code>

<b>Parameter: New column name</b>	'asecY'
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Arccotangent:

For this function, the two different ranges of inputs have different computations, so an `else` condition is added to the transformation. For more information, see *ATAN Function*.

<b>Transformation Name</b>	Conditional column
<b>Parameter: Condition type</b>	if...then...else
<b>Parameter: If</b>	Y > 0
<b>Parameter: Then</b>	round(degrees(atan(divide(1, Y))), 2)
<b>Parameter: Else</b>	round(degrees(atan(divide(1, Y)) + pi()), 2)
<b>Parameter: New column name</b>	'acotY'

Results:

Y	acotY	asecY	acscY	atanY	acosY	asinY
-1.00	-41.86	180.00	-90.00	-45.00	180.00	-90.00
-0.75	-49.99	null	null	-37.00	139.00	-49.00
-0.50	-60.29	null	null	-27.00	120.00	-30.00
0.00	null	null	null	0.00	90.00	0.00
0.50	63.44	null	null	27.00	60.00	30.00
0.75	53.13	null	null	37.00	41.00	49.00
1.00	45.00	0.00	90.00	45.00	0.00	90.00