

# 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  $(-1 \leq Y \leq 1)$

<b>Transformation Name</b>	New formula
<b>Parameter: Formula type</b>	Single row formula
<b>Parameter: Formula</b>	<code>round(degrees(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'
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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'

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>	<code>Y &gt; 0</code>
<b>Parameter: Then</b>	<code>round(degrees(atan(divide(1, Y))), 2)</code>

<b>Parameter: Else</b>	<code>round(degrees(atan(divide(1, Y)) + pi()), 2)</code>
<b>Parameter: New column name</b>	<code>'acotY'</code>

**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	<i>null</i>	<i>null</i>	-37.00	139.00	-49.00
-0.50	-60.29	<i>null</i>	<i>null</i>	-27.00	120.00	-30.00
0.00	<i>null</i>	<i>null</i>	<i>null</i>	0.00	90.00	0.00
0.50	63.44	<i>null</i>	<i>null</i>	27.00	60.00	30.00
0.75	53.13	<i>null</i>	<i>null</i>	37.00	41.00	49.00
1.00	45.00	0.00	90.00	45.00	0.00	90.00