EXAMPLE - Trigonometry Arc Functions

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

Functions:

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

Also:

Item	Description
ROUND Function	Rounds input value to the nearest integer. Input can be an Integer, a Decimal, a column reference, or an expression. Optional second argument can be used to specify the number of digits to which to round.
DEGREES Function	Computes the degrees of an input value measuring the radians of an angle. The value can be a Decimal or Integer literal or a reference to a column containing numeric values.

NOTE: These functions are valid over specific ranges.

The following functions are computed using the above functions.

- 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`
Parameter: Formula type	`Single row formula`
Parameter: Formula	`round(degrees(asin(Y)), 2)`
Parameter: New column name	`'asinY'`

Arccosine:

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

Transformation Name	`New formula`
Parameter: Formula type	`Single row formula`
Parameter: Formula	`round(degrees(acos(Y)), 2)`
Parameter: New column name	`'acosY'`

Arctangent:

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

Transformation Name	`New formula`
Parameter: Formula type	`Single row formula`
Parameter: Formula	`round(degrees(atan(Y)), 2)`
Parameter: New column name	`'atanY'`

Arccosecant:

This function is valid over a set of ranged inputs, so you can use a conditional column for the computation.

Transformation Name	`Conditional column`
Parameter: Condition type	`if...then...else`
Parameter: If	`(Y <= -1) || (Y >= 1)`
Parameter: Then	`round(degrees(asin(divide(1, Y))), 2)`
Parameter: New column name	`'acscY'`

Arcsecant:

Same set of ranged inputs apply to this function.

Transformation Name	Conditional column
Parameter: Condition type	if...then...else
Parameter: If	(Y <= -1) || (Y >= 1)
Parameter: Then	round(degrees(acos(divide(1, Y))), 2)
Parameter: New column name	'asecY'

Arccotangent:

For this function, the two different ranges of inputs have different computations, so an `else` condition is added to the transformation.

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