EXAMPLE - Trigonometry Hyperbolic Arc Functions

This example illustrates how to apply inverse (arc) hyperbolic functions to your transformations.

Functions:

Item	Description
ASINH Function	Computes the arcsine of an input value for a hyperbolic angle measured in radians. The value can be a Decimal or Integer literal or a reference to a column containing numeric values.
ACOSH Function	Computes the arccosine of an input value for a hyperbolic angle measured in radians. The value can be a Decimal or Integer literal or a reference to a column containing numeric values.
ATANH Function	Computes the arctangent of an input value for a hyperbolic angle measured in radians. 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.
NULL Function	The NULL function generates null values.

Source:

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

Y
-4.00
-3.00
-2.00
-1.00
-0.75
-0.50
0.00
0.50
0.75
1.00
2.00
3.00
4.00

Transformation:

The following transformations include checks for the valid ranges for input values.

Hyperbolic arcsine:

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

Hyperbolic arccosine:

Valid over the range (y > 1)

Transformation Name	`New formula`
Parameter: Formula type	`Single row formula`
Parameter: Formula	`if(Y>1,round(degrees(acosh(Y)), 2),null())`
Parameter: New column name	`'acoshY'`

Hyperbolic arctangent:

Valid over the range (-1 < y < 1)

Transformation Name	`New formula`
Parameter: Formula type	`Single row formula`
Parameter: Formula	`if(abs(y)<1,round(degrees(atanh(Y)), 2),null())`
Parameter: New column name	`'atanhY'`

Results:

Y	atanhY	acoshY	asinhY
-4	*null*	*null*	-120.02
-3	*null*	*null*	-104.19
-2	*null*	*null*	-82.71
-1.5	*null*	*null*	-68.45
-1	*null*	*null*	-50.5
-0.75	-55.75	*null*	-39.71
-0.5	-31.47	*null*	-27.57
0	0	*null*	0
0.5	31.47	*null*	27.57
0.75	55.75	*null*	39.71
1	*null*	*null*	50.5

1.5	*null*	55.14	68.45
2	*null*	75.46	82.71
3	*null*	101	104.19
4	*null*	118.23	120.02