

EXAMPLE - Trigonometry Functions

This example illustrates how to apply basic trigonometric functions to your transformations.

Functions:

| Item | Description |
|--------------|--|
| SIN Function | Computes the sine of an input value for an angle measured in radians. The value can be a Decimal or Integer literal or a reference to a column containing numeric values. |
| COS Function | Computes the cosine of an input value for an angle measured in radians. The value can be a Decimal or Integer literal or a reference to a column containing numeric values. |
| TAN Function | Computes the tangent of an input value for an angle measured in radians. The value can be a Decimal or Integer literal or a reference to a column containing numeric values. |

The following functions are computed using the above functions:

- **Cotangent.** Computed as $1/\text{TAN}$.
- **Secant.** Computed as $1/\text{COS}$.
- **Cosecant.** Computed as $1/\text{SIN}$.

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. |
| RADIANS Function | Computes the radians of an input value measuring degrees of an angle. The value can be a Decimal or Integer literal or a reference to a column containing numeric values. |

Source:

In the following sample, input values are in degrees:

| X |
|-----|
| -30 |
| 0 |
| 30 |
| 45 |
| 60 |
| 90 |
| 120 |
| 135 |
| 180 |

Transformation:

In this example, all values are rounded to three decimals for clarity.

First, the above values in degrees must be converted to radians.

| | |
|-----------------------------------|----------------------|
| Transformation Name | New formula |
| Parameter: Formula type | Single row formula |
| Parameter: Formula | round(radians(X), 3) |
| Parameter: New column name | 'rX' |

Sine:

| | |
|-----------------------------------|--------------------|
| Transformation Name | New formula |
| Parameter: Formula type | Single row formula |
| Parameter: Formula | round(sin(rX), 3) |
| Parameter: New column name | 'SINrX' |

Cosine:

| | |
|-----------------------------------|--------------------|
| Transformation Name | New formula |
| Parameter: Formula type | Single row formula |
| Parameter: Formula | round(cos(rX), 3) |
| Parameter: New column name | 'COSrX' |

Tangent:

| | |
|-----------------------------------|--------------------|
| Transformation Name | New formula |
| Parameter: Formula type | Single row formula |
| Parameter: Formula | round(tan(rX), 3) |
| Parameter: New column name | 'TANrX' |

Cotangent:

| | |
|-----------------------------------|-----------------------|
| Transformation Name | New formula |
| Parameter: Formula type | Single row formula |
| Parameter: Formula | round(1 / tan(rX), 3) |
| Parameter: New column name | 'COTrX' |

Secant:

| | |
|--------------------------------|-----------------------|
| Transformation Name | New formula |
| Parameter: Formula type | Single row formula |
| Parameter: Formula | round(1 / cos(rX), 3) |

| | |
|-----------------------------------|---------|
| Parameter: New column name | 'SECrX' |
|-----------------------------------|---------|

Cosecant:

| | |
|-----------------------------------|-----------------------|
| Transformation Name | New formula |
| Parameter: Formula type | Single row formula |
| Parameter: Formula | round(1 / sin(rX), 3) |
| Parameter: New column name | 'CSCrX' |

Results:

| X | rX | COTrX | SECrX | CSCrX | TANrX | COSrX | SINrX |
|-----|--------|-------------|-----------|-------------|-----------|--------|-------|
| -30 | -0.524 | -1.73 | 1.155 | -1.999 | -0.578 | 0.866 | -0.5 |
| 0 | 0 | <i>null</i> | 1 | <i>null</i> | 0 | 1 | 0 |
| 30 | 0.524 | 1.73 | 1.155 | 1.999 | 0.578 | 0.866 | 0.5 |
| 45 | 0.785 | 1.001 | 1.414 | 1.415 | 0.999 | 0.707 | 0.707 |
| 60 | 1.047 | 0.578 | 1.999 | 1.155 | 1.731 | 0.5 | 0.866 |
| 90 | 1.571 | 0 | -4909.826 | 1 | -4909.826 | 0 | 1 |
| 120 | 2.094 | -0.577 | -2.001 | 1.154 | -1.734 | -0.5 | 0.866 |
| 135 | 2.356 | -1 | -1.414 | 1.414 | -1 | -0.707 | 0.707 |
| 180 | 3.142 | 2454.913 | -1 | -2454.913 | 0 | -1 | 0 |