ARCCSCH

PURPOSE

Compute the hyperbolic arccosecant for a variable or parameter.

DESCRIPTION

The hyperbolic arccosecant is the number whose hyperbolic cosecant is equal to the given value. The hyperbolic arccosecant is defined as:

$$\text{arccsch}(x) = \frac{1}{\log(x + \sqrt{x^2 + 1})} \qquad \text{for } x \neq 0 \qquad \textbf{(EQ 7-103)}$$

Input values identically equal to 0 generate an error message.

SYNTAX

LET <y2> = ARCCSCH(<y1>) <SUBSET/EXCEPT/FOR qualification>

where <y1> is a number, parameter, or variable;

<y2> is a variable or a parameter (depending on what <y1> is) where the computed hyperbolic arccosecant value is stored;

and where the <SUBSET/EXCEPT/FOR qualification> is optional.

EXAMPLES

LET A = ARCCSCH(-2)
LET A = ARCCSCH(A1)
LET X2 = ARCCSCH(X1-4)

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

ARCCOS	=	Compute arccosine.
ARCCOSH	=	Compute hyperbolic arccosine.
ARCCOT	=	Compute arccotangent.
ARCCOTH	=	Compute hyperbolic arccotangent.
ARCCSC	=	Compute arccosecant.
ARCSEC	=	Compute secant.
ARCSECH	=	Compute hyperbolic arcsecant.
ARCSIN	=	Compute arcsine.
ARCSINH	=	Compute hyperbolic arcsine.
ARCTAN	=	Compute arctangent.
ARCTANH	=	Compute hyperbolic arctangent.

APPLICATIONS

Trigonometry

IMPLEMENTATION DATE

Pre-1987

PROGRAM

```
X1LABEL HYPERBOLIC COSECANT(Y)
Y1LABEL ARCCOSH(X)
TITLE ARCCSH FOR X = -10 TO 10
YLIMITS -5 5
YTIC OFFSET 0.5 0.5
PLOT ARCCSCH(X) FOR X = 0.01 .01 2.0 AND
PLOT ARCCSCH(X) FOR X = 2 .1 10 AND
PLOT ARCCSCH(X) FOR X = -.01 -.01 -2 AND
PLOT ARCCSCH(X) FOR X = -2 -.1 -10
LINE DOTTED
MOVEDATA -10 0
DRAWDATA 10 0
MOVEDATA 0 5.5
DRAWDATA 0 -5.5
```