

CSCH**PURPOSE**

Compute the hyperbolic cosecant for a variable or parameter.

DESCRIPTION

The hyperbolic cosecant is defined as:

$$\operatorname{csch}(x) = \frac{2}{e^x - e^{-x}} \quad (\text{EQ 7-109})$$

The hyperbolic cosecant is defined for all real numbers except zero. The range is minus infinity to plus infinity.

SYNTAX

LET <y2> = CSCH(<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 cosecant value is stored; and where the <SUBSET/EXCEPT/FOR qualification> is optional.

EXAMPLES

LET A = CSCH(A1)

LET X2 = CSCH(PI/2)

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

CSC	=	Compute cosecant.
SINH	=	Compute hyperbolic sine.
COSH	=	Compute hyperbolic cosine.
TANH	=	Compute hyperbolic tangent.
COTH	=	Compute hyperbolic cotangent.
SECH	=	Compute hyperbolic secant.
ARCCOSH	=	Compute hyperbolic arccosine.
ARCCOTH	=	Compute hyperbolic arccotangent.
ARCCSCH	=	Compute hyperbolic arccosecant.
ARCSECH	=	Compute hyperbolic arcsecant.
ARCSINH	=	Compute hyperbolic arcsine.
ARCTANH	=	Compute hyperbolic arctangent.

APPLICATIONS

Trigonometry

IMPLEMENTATION DATE

Pre-1987

PROGRAM

```
TITLE CSCH(X) FOR X = -3 TO 3
XILABEL X
YILABEL CSCH(X)
YLIMITS -20 20
XLIMITS -3 3
PLOT CSCH(X) FOR X = 0.01 0.01 3 AND
PLOT CSCH(X) FOR X = -0.01 -0.01 -3
LINE DOTTED
MOVEDATA 0 20
DRAWDATA 0 -20
MOVEDATA 3 0
DRAWDATA -3 0
```

