

COTH**PURPOSE**

Compute the hyperbolic cotangent for a variable or parameter.

DESCRIPTION

The hyperbolic cotangent is defined as:

$$\coth(x) = \frac{e^x + e^{-x}}{e^x - e^{-x}} \quad (\text{EQ 7-108})$$

The hyperbolic cotangent is defined for all real numbers except 0. The range is minus infinity to -1 and 1 to plus infinity.

SYNTAX

LET <y2> = COTH(<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 cotangent value is stored;

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

EXAMPLES

LET A = COTH(-2)

LET A = COTH(A1)

LET X2 = COTH(PI/2)

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

COT	=	Compute cotangent.
SINH	=	Compute hyperbolic sine.
COSH	=	Compute hyperbolic cosine.
TANH	=	Compute hyperbolic tangent.
SECH	=	Compute hyperbolic secant.
CSCH	=	Compute hyperbolic cosecant.
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 COTH(X) FOR X = -3 TO 3
XILABEL X
YILABEL COTH(X)
YLIMITS -10 10
XLIMITS -3 3
XTIC OFFSET .1 .1
PLOT COTH(X) FOR X = 0.01 0.01 3 AND
PLOT COTH(X) FOR X = -0.01 -.01 -3
LINE DOTTED
MOVEDATA -3 1
DRAWDATA 3 1
MOVEDATA -3 -1
DRAWDATA 3 -1
MOVEDATA 0 10
DRAWDATA 0 -10
```

