ARCCOTH

PURPOSE
Compute the hyperbolic arccotangent for a variable or parameter.

DESCRIPTION
The hyperbolic arccotangent is the number whose hyperbolic cotangent is equal to the given value. The hyperbolic cotangent is defined as:

$$\text{arccoth}(x) \ = \ \frac{1}{2}\log\left(\frac{x+1}{x-1}\right) \qquad \text{for} \quad x > 1, x < 1 \qquad \textbf{(EQ 7-102)}$$

Input values in the range -1 to 1 generate an error message.

SYNTAX
LET <y2> = ARCCOTH(<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 arccotangent value is stored,;

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

EXAMPLES
LET A = ARCCOTH(-2)
LET X2 = ARCCOTH(X1)
LET X2 = ARCCOTH(X1-4)

DEFAULT
None

SYNONYMS
None

RELATED COMMANDS

ARCCOS	=	Compute arccosine.
ARCCOSH	=	Compute hyperbolic arccosine.
ARCCOT	=	Compute arccotangent.
ARCCSC	=	Compute arccosecant.
ARCCSCH	=	Compute hyperbolic 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 COTANGENT(Y)
Y1LABEL ARCCOTH(X)
TITLE ARCCOTH FOR X = -10 TO 10
PLOT ARCCOTH(X) FOR X = 1.01 .01 2.0 AND
PLOT ARCCOTH(X) FOR X = 2 .1 10 AND
PLOT ARCCOTH(X) FOR X = -1.01 -.01 -2 AND
PLOT ARCCOTH(X) FOR X = -2 -.1 -10
LINE DOT
MOVEDATA -10 0
DRAWDATA 10 0
MOVEDATA 1 3
DRAWDATA 1 -3
MOVEDATA -1 3
DRAWDATA -1 -3
```