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Submitter :

Language : Fortran

Library: MATHLIB

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Hyperbolic Arcsine

Function subprograms ASINH and DASINH calculate the hyperbolic arcsine

$$\operatorname{arcsinh}(x) = \ln(x + \sqrt{x^2 + 1})$$

for real argument x .

On CDC and Cray computers, the double precision version DASINH is not available

Structure:

FUNCTION subprograms

User Entry Names: ASINH, DASINH

Usage:

In any arithmetic expression,

ASINH(X) or DASINH(X) has the value $\operatorname{arcsinh}(X)$,

where ASINH is of type REAL, DASINH is of type DOUBLE PRECISION, and X has the same type as the function name.

Method:

Approximation by truncated Chebyshev series and functional relations.

Accuracy:

ASINH (except on CDC and Cray computers) has full single-precision accuracy. For most values of the argument X, DASINH (and ASINH on CDC and Cray computers) has an accuracy of approximately one significant digit less than the machine precision.

References:

1. Y.L. Luke, Mathematical functions and their approximations, (Academic Press New York, 1975) 66.

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