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Submitter :
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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 $\operatorname{arcsinh}(\texttt{X})$,

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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