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Submitter :
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Arctangent integral

Function subprograms `RATANI` and `DATANI` calculate the arctangent integral

$$\mathrm{Ti}_2(x) \;=\; \int_0^x \frac{\arctan t}{t}\, dt$$

for real argument x.

On CDC and Cray computers, the double-precision version `DATANI` is not available.

Structure:

`FUNCTION` subprograms
User Entry Names: `RATANI`, `DATANI`
Obsolete User Entry Names: `ATANI` $\equiv$ `RATANI`

Usage:

In any arithmetic expression,

`RATANI(X)` or `DATANI(X)` has the value Ti_2(`X`),

where `RATANI` is of type `REAL`, `DATANI` 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:

`RATANI` (except on CDC and Cray computers) has full single-precision accuracy. For most values of the argument `X`, `DATANI` (and `RATANI` 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) 67.

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