Subject: Edits for more mathematical functions
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Reference: 04-388r1, WG5/N1626-J3-019

1 Detailed specification

Provide ACOS, ASIN, ATAN, COSH, SINH, TAN and TANH for complex type. Provide inverse hyperbolic functions, including for complex type. In the case of TAN, specify that the real part of the argument is regarded as a value in radians.

2 Edits

Edits refer to 04-007. Page and line numbers are displayed in the margin. Absent other instructions, a page and line number or line number range implies all of the indicated text is to be replaced by associated text, while a page and line number followed by + (-) indicates that associated text is to be inserted after (before) the indicated line. Remarks are noted in the margin, or appear between [and] in the text.

[Editor: Add the following three summaries in **13.5.2 Mathematical functions** in alphabetical order:] 294:25+

ACOSH(X)	Inverse hyperbolic cosine

ASINH(X)	Inverse hyperbolic sine	294:26+

ATANH(X)	Inverse hyperbolic tangent	294:27+

[Editor: At the end of the **Argument** paragraph of **13.7.3 ACOS (X)**, after "1" insert ", or shall be of type complex".] 301:10

[Editor: At the end of the **Result value** paragraph of **13.7.3 ACOS (X)**, ", expressed in radians. It" ⇒ ". If it is real it is expressed in radians and". At the end of the paragraph insert another sentence "If it is complex the real part is expressed in radians and lies in the range $0 \leq \text{REAL}(\text{ACOS}(\text{X})) \leq \pi$."] 301:13

13.7.3$\frac{1}{2}$ ACOSH (X) 301:14+

Description. Inverse hyperbolic cosine function.

Class. Elemental function.

Argument. X shall be of type real or complex.

Result Characteristics. Same as X.

Result Value. The result has a value equal to a processor-dependent approximation to the inverse hyperbolic cosine function of X. If the result is complex the imaginary part is expressed in radians and lies in the range $0 \leq \text{AIMAG}(\text{ACOSH}(\text{X})) \leq \pi$.

Example. ACOSH (1.5430806) has the value 1.0 (approximately).

[Editor: At the end of the **Argument** paragraph of **13.7.12 ASIN (X)**, after "1" insert ", or of type complex".] 304:14

[Editor: At the end of the **Result value** paragraph of **13.7.12 ASIN (X)**,", expressed in radians. It" ⇒ ". If it is real it is expressed in radians and". At the end of the paragraph insert another sentence "If it is complex the real part is expressed in radians and lies in the range $-\frac{\pi}{2} \leq \text{REAL}(\text{ASIN}(\text{X})) \leq \frac{\pi}{2}$."] 304:17

13.7.12$\frac{1}{2}$ ASINH (X) 304:18+

Description. Inverse hyperbolic sine function.

Class. Elemental function.

Argument. X shall be of type real or complex.

Result Characteristics. Same as X.

Result Value. The result has a value equal to a processor-dependent approximation to the

inverse hyperbolic sine function of X. If the result is complex the imaginary part is expressed in radians and lies in the range $-\frac{\pi}{2} \leq \text{AIMAG(ASINH(X))} \leq \frac{\pi}{2}$.

Example. ASINH (1.1752012) has the value 1.0 (approximately).

[Editor: At the end of the **Argument** paragraph of **13.7.14 ATAN (X)**, after "real" insert "or complex".] 305:31

[Editor: At the end of the **Result value** paragraph of **13.7.14 ATAN (X)**, ", expressed in radians, that" ⇒ ". If it is real it is expressed in radians and". Insert another sentence at the end of the paragraph "If it is complex the real part is expressed in radians and lies in the range $-\frac{\pi}{2} \leq \text{REAL(ATAN(X))} \leq \frac{\pi}{2}$."] 305:34

13.7.15$\frac{1}{2}$ ATANH (X) 306:13+

Description. Inverse hyperbolic tangent function.

Class. Elemental function.

Argument. X shall be of type real or complex.

Result Characteristics. Same as X.

Result Value. The result has a value equal to a processor-dependent approximation to the inverse hyperbolic tangent function of X. If the result is complex the imaginary part is expressed in radians and lies in the range $-\frac{\pi}{2} \leq \text{AIMAG(ATANH(X))} \leq \frac{\pi}{2}$.

Example. ATANH (0.76159416) has the value 1.0 (approximately).

[Editor: At the end of the **Argument** paragraph of **13.7.24 COSH (X)**, after "real" insert "or complex".] 309:7

[Editor: At the end of the **Result value** paragraph of **13.7.24 COSH (X)**, insert a sentence "If X is of type complex its imaginary part is regarded as a value in radians."] 309:9

[Editor: At the end of the **Argument** paragraph of **13.7.111 SINH (X)**, after "real" insert "or complex".] 352:15

[Editor: At the end of the **Result value** paragraph of **13.7.111 SINH (X)**, insert a sentence "If X is of type complex its imaginary part is regarded as a value in radians."] 352:17

[Editor: At the end of the **Argument** paragraph of **13.7.118 TAN (X)**, after "real" insert "or complex".] 355:16

[Editor: At the end of the **Result value** paragraph of **13.7.118 TAN (X)**, ", with X ... radians" ⇒ ". If X is of type real, it is regarded as a value in radians. If X is of type complex, its real part is regarded as a value in radians".] 355:18-19

[Editor: At the end of the **Argument** paragraph of **13.7.119 TANH (X)**, after "real" insert "or complex".] 355:24

[Editor: At the end of the **Result value** paragraph of **13.7.119 TANH (X)**, insert a sentence "If X is of type complex its imaginary part is regarded as a value in radians."] 355:26