Proposal for C2x
WG14 N2118

Title:	TS 18661-4 mathematical functions
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Proposal category:	New features
Target audience:	Science, engineering, mathematics

Abstract: This proposal incorporates the ISO/IEC TS 18661-4 mathematical functions for <math.h> and <tgmath.h> into C2x. The functions include mathematical operations recommended by the current IEC 60559 floating-point standard (2011), where they are specified as correctly rounded. TS 18661-4 does not require correct rounding, but reserves names (with cr prefix) for correctly rounded versions. The new <math.h> functions complete the set of exponential and logarithm functions for bases 2 and 10, include trigonometric functions based on units of pi, and include commonly needed functions involving power and square root operations. The other IEC 60559 mathematical operations are already supported in <math.h> and <tgmath.h>. Another proposal covers the TS 18661-4 specification of the IEC 60559 reduction operations.

Prior art: A number of mathematical functions from TS 18661-4 have been implemented in some form already. Examples are listed below:

HP: exp10, rsqrt, compound (for all binary and decimal types)

GCC, Microsoft: exp10

Microsoft, Khronos: trig functions based on units of pi

Microsoft: rsqrt