

Gautschi, Walter

The incomplete gamma functions since Tricomi. (English) Zbl 0965.33001

Tricomi's ideas and contemporary applied mathematics. Proceedings of the international conference held on the occasion of the 100th anniversary of the birth of Francesco G. Tricomi, Rome, Italy, November 28-29 and Turin, Italy, December 1-2, 1997. Rome: Accademia Nazionale dei Lincei, Atti Convegna Lincei. 147, 203-237 (1998).

This is a very thorough and enjoyable survey on the incomplete gamma functions and their Tricomi-variants $\gamma^*(a, x) = x^{-a} \int_0^x e^{-t} t^{a-1} dt / \Gamma(a)$ and $\gamma_1(a, x) = \Gamma(a) x^a \gamma^*(a, -x)$. There are 160 references and the author even corrects errors in a few. In addition to what the title promises, the paper starts with a brief account of the history of the subject before 1950, followed by an affectionate but not uncritical description of Tricomi's contributions. The main body (two thirds) of the paper deals with approximation, asymptotics, Stokes's phenomenon, zeros, inverse functions, inequalities, monotonicity, numerical methods, generalizations, and links to other special functions after Tricomi.

For the entire collection see [\[Zbl 0948.00034\]](#).

Reviewer: János Aczél (Waterloo/Ontario)

MSC:

- 33-02 Research exposition (monographs, survey articles) pertaining to special functions
- 33B20 Incomplete beta and gamma functions (error functions, probability integral, Fresnel integrals)
- 33-03 History of special functions
- 33C15 Confluent hypergeometric functions, Whittaker functions, ${}_1F_1$
- 33C45 Orthogonal polynomials and functions of hypergeometric type (Jacobi, Laguerre, Hermite, Askey scheme, etc.)
- 33F05 Numerical approximation and evaluation of special functions
- 41A30 Approximation by other special function classes
- 41A58 Series expansions (e.g., Taylor, Lidstone series, but not Fourier series)
- 26A48 Monotonic functions, generalizations
- 26D07 Inequalities involving other types of functions

Cited in 1 Review Cited in 25 Documents
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Keywords:

incomplete gamma functions; confluent hypergeometric functions; Laguerre polynomials; error function; Stokes's phenomenon; inequalities; monotonicity; numerical methods