

INEQUALITIES FOR THE INCOMPLETE GAMMA AND RELATED FUNCTIONS

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Abstract. In the article, some inequalities of the incomplete gamma function $\int_0^x e^{-t^p} dt = \left[\Gamma(1/p) - \Gamma(1/p, x^p) \right] / p$ and the related function $\int_0^x e^{t^p} dt$ for $x > 0$, $p > 0$ are established by using Hermite-Hadamard inequality.

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REFERENCES

- [1] HORST ALZER, *On some inequalities for the incomplete gamma function*, Mathematics of Computation **66** (1997), 771–778.
- [2] J. T. CHU, *On bounds for the normal integral*, Biometrika **42** (1955), 263–265.
- [3] J. M. CONTE, ET AL., *Solution of problem 5607*, Revue Math. Spec. **74** (1963/64), 227–230.
- [4] FENG QI AND ZHENG HUANG, *Inequalities of the complete elliptic integrals*, Tamkang Journal of Mathematics **29** (1998), no. 3, 165–169.
- [5] W. GAUTSCHI, *Some elementary inequalities relating to the gamma and incomplete gamma function*, J. Math. Phys. **38** (1959), 77–81.
- [6] JI-CHANG KUANG, *Applied Inequalities*, 2nd edition, Hunan Education Press, Changsha, China, 1993, pp. 591–593. (Chinese)
- [7] D. S. MITRINOVIĆ, *Analytic Inequalities*, Springer-Verlag, 1970, pp. 177–181, 291–292 and 385.
- [8] D. S. MITRINOVIĆ, J. E. PEČARIĆ AND A. M. FINK, *Classical and New Inequalities in Analysis*, Kluwer Academic Publishers, Dordrecht/Boston/London, 1993.
- [9] FENG QI, LI-HONG CUI AND SEN-LIN XU, *Applications of Tchebycheff's integral inequality*, Publ. Inst. Mat. Beograd. N. Ser. (1999), to appear.
- [10] A. LAFORGIA AND S. SISMONDI, *Monotonicity results and inequalities for the gamma and error functions*, Comp. Appl. Math. **23** (1998), 25–33.