

A REMARK ON SOME ACCURATE ESTIMATES OF π

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Abstract. In this paper we correct and generalize some inequalities related to an accurate asymptotic series of π . A recurrence for the coefficients of this asymptotic series involving the Euler numbers is established as well.

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REFERENCES

- [1] M. ABRAMOWITZ, I. A. STEGUN (EDS.), *Handbook of Mathematical Functions with Formulas, Graphs, and Mathematical Tables*, New York, Dover, 1972.
- [2] J. L. FIELDS, *A note on the asymptotic expansion of a ratio of gamma functions*, Proc. Edinburgh Math. Soc. **15** (1966), 43–45.
- [3] C. L. FRENZEN, *Error bounds for asymptotic expansions of the ratio of two gamma functions*, SIAM J. Math. Anal. **18** (1987), 890–896.
- [4] C. MORTICI, *On some accurate estimates of π* , Bull. Math. Anal. Appl. **2** (2010), 137–139.
- [5] F. W. J. OLVER, D. W. LOZIER, R. F. BOISVERT, C. W. CLARK (EDS.), *NIST Handbook of Mathematical Functions*, Cambridge University Press, New York, 2010.
- [6] J. WALLIS, *Computation of π by successive interpolations*, (1655) in *A Source Book in Mathematics, 1200–1800* (D. J. Struik, Ed.), Harvard University Press, Cambridge, MA, 1969, 244–253.