

NEW SHARP ESTIMATES OF THE GENERALIZED EULER–MASCHERONI CONSTANT

VASILE BERINDE AND CRISTINEL MORTICI

Abstract. The aim of this paper is to establish new sequences which converge towards the Euler–Mascheroni constant. Our results solve some open problems posed by Berinde [A new generalization of Euler’s constant *Creat. Math. Inform.* 18 (2009) no. 2 123–128] and extend some results of DeTemple, [A quicker convergence to Euler’s constant *Amer. Math. Monthly* 100 (1993) 468–470] and Sîntămărian [A generalization of Euler’s constant, *Numer. Algorithms* 46 (2007), 141–151].

Mathematics subject classification (2010): 33B15, 41A10, 42A16.

Keywords and phrases: Euler–Mascheroni constant, inequalities, approximations.

REFERENCES

- [1] H. ALZER, *Inequalities for the gamma and polygamma functions*, *Abh. Math. Sem. Univ. Hamb.* **68** (1998), 363–372.
- [2] V. BERINDE, *A new generalization of Euler’s constant*, *Creat. Math. Inform.* **18**, 2 (2009), 123–128.
- [3] D. W. DE TEMPLE, *A quicker convergence to Euler’s constant*, *Amer. Math. Monthly* **100**, 5 (1993), 468–470.
- [4] E. A. KARATSUBA, *On the computation of the Euler constant γ* , *Computational methods from rational approximation theory (Wilrijk, 1999)*, *Numer. Algorithms* **24**, 1–2 (2000), 83–97.
- [5] K. KNOPP, *Theory and Applications of Infinite Series*, Blackie, London, **453** (1951).
- [6] C. MORTICI, *Best estimates of the generalized Stirling formula*, *Appl. Math. Comput.* **215**, 11 (2010), 4044–4048.
- [7] C. MORTICI, *Product approximations via asymptotic integration*, *Amer. Math. Monthly* **117**, 5 (2010), 434–441.
- [8] C. MORTICI, *An ultimate extremely accurate formula for approximation of the factorial function*, *Arch. Math. (Basel)* **93**, 1 (2009), 37–45.
- [9] C. MORTICI, *New approximations of the gamma function in terms of the digamma function*, *Appl. Math. Lett.* **23**, 1 (2010), 97–100.
- [10] C. MORTICI, *Complete monotonic functions associated with gamma function and applications*, *Carpathian J. Math.* **25**, 2 (2009), 186–191.
- [11] S.-L. QIU, M. VUORINEN, *Some properties of the gamma and psi functions with applications*, *Math. Comp.* **74**, 250 (2005), 723–742.
- [12] A. SÎNTĂMĂRIAN, *A generalization of Euler’s constant*, *Numer. Algorithms* **46**, 2 (2007), 141–151.
- [13] L. TÓTH, *Problem E 3432*, *Amer. Math. Monthly* **98**, 3 (1991), 264.
- [14] R. M. YOUNG, *Euler’s constant*, *Math. Gaz.* **75**, 472 (1991), 187–190.