

**Sondow, Jonathan; Zudilin, Wadim**

**Euler's constant,  $q$ -logarithms, and formulas of Ramanujan and Gosper.** (English)

Zbl 1132.11056

Ramanujan J. 12, No. 2, 225-244 (2006).

This paper deals with several interesting results concerning Euler's constant  $\gamma = \lim_{n \rightarrow \infty} ((\sum_{j=1}^n \frac{1}{j}) - \log n)$ . Some tests concerning the rationality and irrationality of  $\gamma$  are given. The problem whether  $\gamma$  is an irrational number is not done.

Reviewer: Jaroslav Hančl (Ostrava)

**MSC:**

- 11Y60 Evaluation of number-theoretic constants
- 11J72 Irrationality; linear independence over a field
- 33D15 Basic hypergeometric functions in one variable,  ${}_r\phi_s$

Cited in 9 Documents

**Keywords:**

irrationality; Euler constant; hypergeometric series

**Full Text:** DOI arXiv

**References:**

- [1] Bailey, W.N.: Generalized Hypergeometric Series, Cambridge Math. Tracts Vol. 32 Cambridge Univ. Press Cambridge (1935) 2nd reprinted edition New York–London Stechert-Hafner (1964) · Zbl 0011.02303
- [2] Berndt, B.C., Bowman, D.C.: Ramanujan's short unpublished manuscript on integrals and series related to Euler's constant. Constructive, Experimental, and Nonlinear Analysis (Limoges, 1999) CMS Conf. Proc. M. Thera Amer. Math. Soc. Providence, RI, 27, 19–27 (2000) · Zbl 0964.40004
- [3] Borwein, P.: On the irrationality of  $\sum_{n=0}^{\infty} \frac{1}{q^{n+r}}$ . J. Number Theory. 37, 253–259 (1991) · Zbl 0718.11029
- [4] Catalan, E.: Sur la constante d'Euler et la fonction de Binet. Liouville J. I(3), 209–240 (1875) · Zbl 07.0158.02
- [5] Gosper, Jr. R.W.: Personal communication (7 May 2002); Item 120: Accelerating series. HAKMEM Artificial Intelligence Memo No. 239 Massachusetts Institute of Technology, A. I. Laboratory (1972); <http://www.inwap.com/pdp10/hbaker/hakmem/hakmem.html>
- [6] Rosser, J.B., Schoenfeld, L.: Approximate formulas for some functions of prime numbers. Illinois J. Math. 6, 64–94 (1962) · Zbl 0122.05001
- [7] Sebah, P.: Personal communication (17 December 2002)
- [8] Sondow, J. Criteria for irrationality of Euler's constant. Proc. Amer. Math. Soc. 131, 3335–3344 (2003) · Zbl 1113.11040
- [9] Sondow, J.: A hypergeometric approach, via linear forms involving logarithms, to irrationality criteria for Euler's constant; E-print math.NT/0211075 (November 2002)
- [10] Vacca, G.: A new series for the Eulerian constant  $\{\gamma\} = .577 \{\gamma\}$ . Quart. J. Pure Appl. Math. 41, 363–364 (1910) · Zbl 41.0498.04

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