

EVALUATION OF A CUBIC EULER SUM

RAMYA DUTTA

Abstract. In this paper we calculate the cubic series

$$\sum_{n=1}^{\infty} \left(\frac{H_n}{n} \right)^3$$

and two related Euler Sums of weight 6 by a technique involving only the manipulation of series. We also provide a second approach of the computation involving special logarithmic integrals.

Mathematics subject classification (2010): 33B15, 33B30, 40B10, 40C05.

Keywords and phrases: Logarithmic integrals, harmonic numbers, Euler sums, Riemann zeta function.

REFERENCES

- [1] J. M. BORWEIN, R. GIRGENSOHN, *Evaluation of triple Euler sums*, Electron. J. Combin. (1996), 2–7.
- [2] JUNESANG CHOI, H. M. SRIVASTAVA, *Explicit evaluation of Euler and related sums*, Ramanujan Journal **10** (2005), 51–70.
- [3] C. MARKET, *Triple sums and the Riemann zeta function*, J. Number Theory **48** (1994), 113–132.
- [4] L. TORNHEIM, *Harmonic double series*, Amer. J. Math. **72** (1950), 303–314.
- [5] J. G. HUARD, K. S. WILLIAMS, AND N.-Y. ZHANG, *On Tornheim's double series*, Acta Arithmetica **75** (1996), 105–117.
- [6] C. I. VALEAN, O. FURDUI, *Reviving the quadratic series of Au-Yeung*, J. Classical Anal. **6** (2015), no. 2, 113–118.