

ON THE p -ADIC LOG BETA FUNCTION

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MSC 2000: 11S80, 33D05

Abstract

Let p be a fixed prime number. By $\mathbb{Z}_p, \mathbb{Q}_p$ and \mathbb{C}_p we denote the ring of p -adic integers, the field of p -adic numbers and the completion of the algebraic closure of \mathbb{Q}_p , respectively.

J. Diamond (1977) gave a definition for the p -adic log gamma function $G_p : \mathbb{C}_p \setminus \mathbb{Z}_p \rightarrow \mathbb{C}_p$ by the Volkenborn integral

$$G_p(x) := \int_{\mathbb{Z}_p} ((x+u) \log_p(x+u) - (x+u)) du$$

where \log_p is the p -adic logarithm function.

In the present work we consider the p -adic log beta function and we obtain some its properties.

Keywords: p -adic number, p -adic logarithm function, p -adic log gamma function, p -adic log beta function.

References

- [1]J. Diamond, The p -adic log gamma function and p -adic Euler constants, Trans. Amer. Math. Soc. **233** (1977) 321-337.
- [2]K. Iwasawa, Lectures on p -Adic L-Functions Ann. of Math. Stud., vol. 74 Princeton Univ. Press, Princeton, NJ, 1972.
- [3]A. M. Robert, A Course in p -adic Analysis, Graduate Texts in Mathematics 198, Springer-Verlag New York, 2000.