

Contemporary Mathematics
Volume 254, Pages 79-126, 2000

Incomplete Elliptic Integrals in Ramanujan's Lost Notebook

Berndt, Bruce C. ; Chan, Heng-Huat; Huang, Sen-Shan

Abstract

On pages 51–53 of his lost notebook, S. Ramanujan expressed several integrals of products of Dedekind eta-functions in terms of incomplete elliptic integrals of the first kind. In this paper, we prove these identities using only results found in Ramanujan's notebooks. We then construct several new elliptic integrals of this type using modular identities associated with certain "Hauptmoduls."