

1018-11-126

**Bruce C. Berndt\*** ([berndt@math.uiuc.edu](mailto:berndt@math.uiuc.edu)), Department of Mathematics, University of Illinois, 1409 W. Green St., Urbana, IL 61801. *Ramanujan's modular equations and partition congruences*. Preliminary report.

H.M.Farkas and I.Kra recently established three theta function identities and interpreted them in terms of partitions. Perhaps their most interesting theorem is the following result. Let  $S$  denote the set consisting of one copy of the positive integers and one additional copy of those positive integers congruent to 0 modulo 7. Then for each positive integer  $k$ , the number of partitions of  $2k$  into even elements of  $S$  is equal to the number of partitions of  $2k + 1$  into odd elements of  $S$ . Further proofs of this theorem have been given by M.D. Hirschhorn and S.O. Warnaar. In fact, this theorem is equivalent to a modular equation discovered by C.Guetzlaff in 1834 and rediscovered by Ramanujan. We use Ramanujan's modular equations to establish four more theorems of this type, one of which is due to Farkas and Kra, and the other three being new. (Received March 02, 2006)