

Turkish Journal of Mathematics

Turkish Journal

The Rank and the Crank Modulo 5

of

A. Bülent EKİN

Mathematics

 [Keywords](#)
 [Authors](#)

Abstract: Let $p(n)$ denote the number of partitions of n . Ramanujan's partition congruences are $p(5n + 4) \equiv 0 \pmod{5}$, $p(7n + 5) \equiv 0 \pmod{7}$, and $p(11n + 6) \equiv 0 \pmod{11}$, respectively. These have been proved in number of ways. Atkin and Swinnerton-Dyer proved the congruences and some more relations about partition. In the case of mod5 and 7 in terms of rank, Garvan proved them in three cases in terms of crank. In this study, we give another proof of their results in the case of mod5 by using the theory of modular forms. Although our method is more tedious and complicated, it shows us how Modular forms of integral weight on a certain subgroups of $SL_2(\mathbb{Z})$ play role in partition theory. Our method could be applied to the case mod7, but not mod11 since the components of (b, k) are not known explicitly.



math@tubitak.gov.tr

Turk. J. Math., **21**, (1997), 169-178.

Full text: [pdf](#)

Other articles published in the same issue: [Turk. J. Math., vol.21, iss.2.](#)

[Scientific Journals Home](#)
[Page](#)