

Arithmetic Properties of Overpartition Pairs

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Abstract: Bringmann and Lovejoy introduced a rank for overpartition pairs and investigated its role in congruence properties of $\overline{pp}(n)$, the number of overpartition pairs of n . In particular, they applied the theory of Klein forms to show that there exist many Ramanujan-type congruences for $\overline{pp}(n)$. In this paper, we derive two Ramanujan-type identities and some explicit congruences for $\overline{pp}(n)$. Moreover, we find three ranks as combinatorial interpretations of the fact that $\overline{pp}(n)$ is divisible by three for any n . We also construct infinite families of congruences for $\overline{pp}(n)$ modulo 3 and 5, and two congruence relations modulo 9.

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Keywords: overpartition pairs, rank of overpartition pairs, congruence, sum of squares.

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