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Partitions into distinct large parts. (English) Zbl 0824.11064

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Let $q_m(n)$ denote the number of partitions of the positive integer n into distinct parts, each of which is at least m. As to the relatively small values of m, *P. Erdős* and the reviewer [Topics in classical number theory, Colloq. Budapest 1981, Colloq. Math. Soc. J. Bolyai 34, 397-450 (1984; Zbl 0548.10010)] observed that $q_m(n) \sim q_1(n)/2^{m-1}$ for $1 \leq m \leq n^{1/5}$ and $n \to \infty$. *P. Erdős*, *J.-L. Nicolas* and the reviewer [Number theory (Ulm, 1987), Lect. Notes Math. 1380, 19-30 (1989; Zbl 0679.10013)] proved that $q_m(n) \sim q_1(n)\prod_{j=1}^{m-1}(1+\exp(-\pi j(12n)^{-1/2}))^{-1}$ for $m \leq n^{3/8-\varepsilon}$, $\varepsilon > 0$.

In the paper under review the authors give an asymptotic estimate of $q_m(n)$ as $n \to \infty$, valid for $m = o(n\log^{-9} n)$. However, the main term of the estimate for $q_m(n)$ in Theorem 1 involves a parameter which is not given explicitly in terms of m and n. Theorem 2 yields an explicit asymptotic estimate for $q_m(n)$ which is valid for m relatively large compared with $n^{1/2}$ and involves the inverse of the function $x^{-2}\int_x^\infty y(1+\exp(y))^{-1}dy$.

As a corollary, the authors obtain a family of asymptotic estimates for $q_m(n)$ in terms of elementary functions, each estimate being valid for large m in a specified interval of length at least $n^{1/3}$. Finally, Theorem 3 refers to $m = o(n^{1/3})$.

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MSC:

11P82 Analytic theory of partitions

Keywords:

partitions into parts which are unequal and large