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Short communications

On partitions of N into summands coprime to N

P. Erdös and B. Richmond

Let $R(n)$ and $R'(n)$ denote the number of partitions of n into summands and distinct summands respectively that are relatively prime to n. Erdös obtained the first results concerning the asymptotic behaviour of these functions showing that

$$\log R(n) \sim \pi\sqrt{\tfrac{2}{3}}\,\phi^{1/2}(n)$$

$$\log R'(n) \sim \pi\sqrt{\tfrac{1}{3}}\,\phi^{1/2}(n)$$

where $\phi(n)$ denotes Euler's function. Richmond showed that the error terms in the above result are $0\{\exp((1+\epsilon)\log 2\log n/\log\log n)\}$ by showing that the asymptotic results of Roth and Szekeres hold for this problem. In this note previous results are improved and a certain set of integers is exhibited for which asymptotic expansions in terms of standard number-theoretic functions may be obtained.

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About orthogonal permutations of the group $G = G(2)XG(k)$

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Let the group $G = G(2)XG(k)$ of order $n = 2k$, k even, such that:

$$G = \{(0,0),(0,1),\ldots,(0,k-1),(1,0),(1,1),\ldots,(1,k-1)\}\,[1],$$

with

$$a \pm b = (a_1, a_2) \pm (b_1, b_2) = ((a_1 \pm b_1)(\mathrm{mod}\ 2), (a_2 \pm b_2)(\mathrm{mod}\ k)),\ a, b \in G$$