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Erdős, Paul; Dudley, Underwood

Some remarks and problems in number theory related to the work of Euler. (In English)

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The problems in number theory referred to in the title include: the prime number theorem; Erdős' conjecture that if $1 \leq a_1 < a_2 < a_3 \dots$ is a sequence of integers for which $\sum_{n=1}^{\infty} (a_n)^{-1} = \infty$, then the sequence $\{a_n\}$ contains arbitrarily long arithmetical progressions; the number $p(n)$ of partitions of n ; the Euler function $\varphi(n)$; the sum of reciprocal squares and the Zeta-function; and others. In each case the authors indicate Euler's contribution to the subject and sketch later developments. In a number of cases they state their surprise that Euler did not pursue matters further, writing, for instance, that "with a little experimentation Euler could have discovered the prime number theorem". The authors see these cases as evidence that, in number theory, Euler was not primarily interested in the functions that occur.

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Classification:

01A50 Mathematics in the 18th century

11-03 Historical (number theory)

11N05 Distribution of primes

11B25 Arithmetic progressions

00A07 Problem books

Keywords:

prime number theorem; Erdős conjecture; arithmetical progressions; number of partitions; Euler function; sum of reciprocal squares; Zeta- function