

**Zbl 368.10002**

**Erdős, Paul**

*Problems and results on combinatorial number theory. III.* (In English)

**Number Theory Day, Proc. Conf., New York 1976, Lect. Notes Math. 626, 43- 72 (1977).**

[For the entire collection see Zbl 355.00010.]

Yet another Erdős collection of problems, following two previous collections of 1973 and 1974 with the same title [cf. Survey Combin. Theory. Colorado 1971, 117-138 (1973; Zbl 263.10001) and Astérisque 24-25, 295-310 (1975; Zbl 305.10050)]. The topics covered include covering systems of congruences and their applications, prime numbers, density problems for sequence with additive or multiplicative properties, and many others. There is the expected variety of old chestnuts and new problems, with information on partial results so far obtained. The largest prize offered is 3000 dollars for a proof or disproof of the following conjecture: if  $1 \leq a_1 < a_2 < \dots$  is any sequence of integers such that  $\sigma_{\frac{1}{a_1}} = \infty$ , then the sequence contains, for every  $k$ , an arithmetic progression of  $k$  terms. If true, this conjecture would imply that for every  $k$  there are  $k$  primes in arithmetic progression. How hard this problem is likely to be is clear from the fact that a conjecture of 40 years' standing, that the smallest modulus in a covering system of congruences can be arbitrarily large, carries a prize of only 500 dollars.

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Classification:

11-02 Research monographs (number theory)

11B99 Sequences and sets

00A07 Problem books