
Zbl 016.01204
Erdős, Paul
On the density of some sequences of numbers. II. (In English)
J. London Math. Soc. 12, 7-11 (1937).

In a previous paper with the same title (see Zbl 012.01004) the author proved that if $f(m)$ is a non-negative arithmetical function for which

$$f(m_1m_2) = f(m_1) + f(m_2) \text{ if } (m_1, m_2) = 1, \tag{1}$$

and for which

$$f(p_1) \neq f(p_2) \tag{2}$$

for any two different primes p_1, p_2, then $f(m)$ has a density-distribution, i.e.

$$\lim_{n\to\infty} n^{-1} \sum_{\substack{m\le n \\ f(m)\ge c}} 1$$

exists and is a continuous function of c. In this paper the author proves that this result also holds when (2) is not assumed. First it is shown that it may be supposed without loss of generality that $f(p^\alpha) = f(p)$, $\sum f(p)/p$ converges, $\sum_{f(p)\neq 0} 1/p$ diverges. The difficulty then lies in proving Lemma I of the previous paper without making use of (2). This is done by an ingenious but complicated argument, which it is impossible to sketch here. One of the arguments used is very similar to one used by *F.Behrend* (see Zbl 012.05203).

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Classification:
11N60 Distribution functions (additive and positive multipl. functions)