

The first part of the paper is devoted to a discussion of the
 general principles of the theory of the ζ -function. It is shown
 that the ζ -function is a meromorphic function of s in the
 complex plane, with a simple pole at $s=1$ and a simple zero at
 $s=0$. The residue at $s=1$ is $1/(2\pi i)$ and the residue at
 $s=0$ is $-\frac{1}{2}$. The functional equation of the ζ -function is
 derived, and it is shown that the ζ -function is bounded in
 the critical strip $0 < \sigma < 1$. The asymptotic expansion of the
 partial sums of the series $\sum_{n \leq x} \Lambda(n)$ is obtained, and it is
 shown that the error term is $O(x^{-1/2})$. The asymptotic
 expansion of the series $\sum_{n \leq x} \Lambda(n) \log n$ is also obtained,
 and it is shown that the error term is $O(x^{-1/2})$. The
 asymptotic expansion of the series $\sum_{n \leq x} \Lambda(n) \log^2 n$ is
 also obtained, and it is shown that the error term is $O(x^{-1/2})$.
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