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*The theory of the Riemann zeta-function*, by E. C. Titchmarsh, Oxford University Press, 1951, 6 + 346 pp., $8.00

The zeta-function was introduced almost 100 years ago by Riemann in his famous memoir on the number of primes less than a given number. While since then enough has been discovered about the zeta-function to justify its use in analytic number theory, the question raised by Riemann about the location of its zeros remains unanswered. The milder hypothesis of Lindelöf that $\zeta(1/2 + it) = O(t^\epsilon)$ for every $\epsilon > 0$ also remains unsettled. The zeta-function continues to be a major challenge to mathematicians.

The author in his well known Cambridge Tract of 1930 gave a remarkably comprehensive and concise account of the zeta-function. Now he has given an expanded account in order to include recent results of which the most notable are due to A. Selberg. The sole prerequisite for reading this treatise is a knowledge of the fundamentals of function theory. The author is an excellent expositor of the kind of analysis that up to now has been the major tool in research on the zeta-function.

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The final chapter is on calculations relating to the zeros of $\zeta(s)$. After indicating how the early zeros are shown to lie on the critical line the author observes that if the Riemann hypothesis is false this could be shown by using modern calculating devices.

N. Levinson

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