

# How to prove the prime number theorem using Fourier analysis

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The famous *prime number theorem* states that the number of primes between 1 and  $x$  grows asymptotically like  $x/\log x$  as  $x \rightarrow \infty$ . This result was first proved independently by Hadamard and de la Vallée Poussin in 1896. In this talk I will present a relatively short proof of the prime number theorem based on an important Tauberian theorem due to Ingham and Karamata. The proof uses only elementary Fourier analysis. If time permits I will also indicate how one may use recent quantified versions of the Ingham-Karamata theorem to obtain bounds on the error term in the prime number theorem.