

ϕ and σ : from Euler to Erdős

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Abstract

In the first part of this talk, we will survey various old and new results related to the distribution of the values of the Euler function $\phi(n)$ and the sum of divisors function $\sigma(n)$ of a positive integer n as well as to the distribution of those positive integers satisfying certain equations involving such functions, like the perfect numbers and the amicable numbers. In the second part of the talk, we will give some of the ideas involved in a proof of a recent result obtained jointly with Kevin Ford and Carl Pomerance which says that there are infinitely common values in the ranges of these two functions. This settles a 50 year old question of Paul Erdős.