Filip Saidak The Prime Numbers Without the Sieve of Eratosthenes, Fibonacci Quart. 55 (2017), no. 4, 352–356.

Abstract

The question of enumerating the sequence of the prime numbers is one of the oldest and most fruitful in all of mathematics. In this paper, we propose a simple new recursive technique (essentially different from all sieve methods, including the original one due to Eratosthenes) for explicitly listing the primes; and it is based only on a new general density hypothesis concerning their overall distribution. The currently conditional status of this iterative device is offset by at least one major advantage: formulation of a self-perpetuating principle unhindred by fixed magnitudes and bounds that limit all sieves.