Prime Numbers in Disguise: Examining the Base Counterparts of Primes

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Abstract

This study used programs coded in C# to observe patterns in prime numbers across bases greater than 10. It was hypothesized that the comparison would suggest a way to produce prime numbers with an accuracy rivaling current primality tests. Though no strong correlations emerged, almost all base 12 primes from 2 to 100 (with the exception of 2 and 3) ended with one of the following digits: 1, 5, 7, B. Another tentative pattern was that each prime number from 2 to 100 in base 10, retained its primality when converted into another specific base. With further research, these patterns may be solidified and have potential applications in increasing efficiency of key generation in cryptography. The Rivest, Shamir, Adleman algorithm (RSA), for example, relies on multiplying two large primes to produce a key.