

On a recursive formula for the sequence of primes and applications to the twin prime problem

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1 Abstract

In this paper we give a recursive formula for the sequence of primes $\{p_n\}$ and apply it to find a necessary and sufficient condition in order that a prime number p_{n+1} is equal to $p_n + 2$. Applications of previous results are given to evaluate the probability that p_{n+1} is of the form $p_n + 2$; moreover we prove that the limit of this probability is equal to zero as n goes to ∞ . Finally, for every prime p_n we construct a sequence whose terms that are in the interval $[p_n^2 - 2, p_{n+1}^2 - 2[$ are the first terms of two twin primes. This result and some of its implications make furthermore plausible that the set of twin primes is infinite.

References

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