A Simple Criteria of Prime Numbers

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Abstract: In this short note, we will propose a simple criteria for prime numbers and our method seems to be that it is practical. Our idea will have some connection with the famous Goldbach conjecture.

Key Words: Prime number, criteria for prime numbers, Goldbach conjecture

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1 Introduction

We are challenging in the famous Goldbach conjecture, of course, the open problem is not simple. See the references for the Goldbach conjecture. In connection with this challenge, we found a simple criteria for prime numbers that seems to be practical and simple.

2 Criteria for prime numbers

Algorithm: *We assume that A is an integer $A > 5$ and we set $a = A - 3$. For the positive integers*

$$x < \frac{A-3}{2},$$

if one of the fractions

$$k = \frac{a-2x}{2x+3}$$

is an integer, then A is not a prime number. If for an odd A, they are not integers, then A is a prime number.

3 Proof of the algorithm

From the decomposition

$$\begin{aligned} A &= 3 + 2x + a - 2x \\ &= (3 + 2x)\left(1 + \frac{a - 2x}{2x + 3}\right) \\ &= (3 + 2x)(1 + k), \end{aligned}$$

the statement is clear, directly.

Our algorithm will have some important connection with the Goldbach conjecture.

References

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