

Solving the Binary Goldbach Problem

Kurmet Sultan

ABSTRACT: The article provides a solution to the binary Goldbach problem based on the ternary Goldbach problem.

KEYWORDS: even, odd, prime, Goldbach's conjecture, binary Goldbach's problem, Euler's problem, Goldbach's ternary problem.

1 INTRODUCTION

Goldbach's conjecture (Goldbach's problem, Euler's problem, binary Goldbach's problem) is the statement that any even number starting from 4 can be represented as the sum of two primes. Christian Goldbach, in 1742 sent a letter to Leonard Euler [1] in which he made the following assumption: every odd number greater than 5 can be represented as the sum of three primes. Euler became interested in the problem and put forward a stronger hypothesis: every even number greater than two can be represented as the sum of two primes. The first statement is called the ternary Goldbach problem, the second is called the binary Goldbach problem, sometimes the Euler problem.

Goldbach's conjecture is one of the most famous open mathematical problems, included in the legendary list of Hilbert problems [2] and is one of the few Hilbert problems that still remain unsolved. This conjecture is also included in the list of four important mathematical problems of Landau [3]. Note that the ternary problem of Goldbach in 2013 was proved by Harald Andres Helfgott [4], however, it has not yet been published in peer-reviewed journals.

2 PROOF

The binary Goldbach problem is solved under the assumption that the solution proposed by Helfgott to the ternary Goldbach problem is correct.

REFERENCES

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