Goldbach's conjecture

Bassera Hamid

June 4, 2024

Introduction
In this article I try to make my modest contribution to the proof of Goldbach's conjecture and I propose to simply go through its negation.

Let E be the prime numbers set.

The Goldbach conjecture states that :

$\forall k \in \mathbb{N}^*/\{1\} \quad \exists (p, p') \in E \ / \qquad 2k = p + p'$

If not then :

$\exists k \in \mathbb{N}^*/\{1\} \quad \forall (p, p') \in E \ / \quad 2k \neq p + p'$

So, either 2k $<$ p+p' or 2k $>$ p+p'

if 2k $<$ p+p' then for $p' = 2$, 2k-2 $<$ p. But $k \geq 2$ and so $2k - 2 \geq 2$, then $\forall p \in E \quad 2 <$ p, which is absurd because $2 \leq p$

if 2k $>$ p+p' then for $p' = 2$, p $<$ 2k-2, so E is bounded and this is absurd.

So, the negation of Goldbach statement is false.

Conclusion : The Goldbach's conjecture is true.