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Goldbach's Conjecture

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#### Abstract

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:

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

Suppose this statement is false, then :

$$
\begin{aligned}
& \exists k \in \mathbb{N}^{*} /\{1\} \quad \forall\left(p, p^{\prime}\right) \in E^{2} / \quad 2 k \neq p+p^{\prime} \\
& 2 k \neq p+p^{\prime} \text { is equivalent to either } 2 \mathrm{k}<\mathrm{p}+\mathrm{p}^{\prime} \text { or } 2 \mathrm{k}>\mathrm{p}+\mathrm{p}
\end{aligned}
$$

in the case $2 \mathrm{k}<\mathrm{P}+\mathrm{P}$ '
as $p$ and $p^{\prime}$ are arbitrary we can set the value of $p^{\prime}$ to 2 for example then, $2 \mathrm{k}-2<\mathrm{p}$.
but $\mathrm{k} \geq 2$ then $2 \leq 2 \mathrm{k}-2$ so $\forall \mathrm{p} \in \mathrm{E} 2<\mathrm{p}$,
it does mean that 2 is not prime! which is absurd.
in the case $2 \mathrm{k}>\mathrm{P}+\mathrm{P}^{\prime}$ then for $\mathrm{P}^{\prime}=2, \mathrm{P}<2 \mathrm{k}-2$, so E is bounded and this is absurd too.
So, the negation of Goldbach statement is false.
Conclusion: The Goldbach's conjecture is true.

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