PROOF OF GOLDBACH'S CONJECTURE.

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Goldbach's Conjecture states that all even numbers greater than 2 can be expressed as the sum of two prime numbers.

Suppose that the Conjecture is not true and assume that there is at least one first even number $2n$ ($n \in IN$) that cannot be expressed as the sum of two prime numbers. How does this condition affect the preceding even number, $2n - 2$, for which the Conjecture must hold?

Let $\{C_{2n}\}$ be the set of composite numbers C_j, C_i, C_k, C_h, … that are all less than $2n$, and let $\{P_{2n}\}$ be the set of prime numbers P_j, P_i, $P_{i'}$, … that are all less than $2n$.

For $2n$, the following must be true:

A) $2n = C_h + C_k$

B) $2n = C_j + P_j$, but not C)

C) $2n = P_i + P_j$.

Subtracting 2 from both sides of the two equalities above gives:

A') $2n - 2 = C_h + C_k - 2$.

B') $2n - 2 = C_j + P_j - 2$.

The prime number P_j represents both a specific prime number and each and every prime number $\in \{P_{2n}\}$ in general, such that if $(C_j - 2)$ is a composite number $\in \{C_{2n}\}$, all of these prime numbers are symmetrical about $\frac{2n-2}{2} = n - 1$ to a composite number, and thus the Conjecture would not hold.

If the number $(C_j - 2)$ were a prime number $P_{j'}$, this would also be the case for all prime numbers symmetrical to P_j about the number $(n - 1)$, which would mean: $2n - 2 = Pj + Pj'$, which is impossible, because this would require the prime numbers P_j to be distributed symmetrically to $P_{j'}$ about the number $n - 1$, and that contradicts the results of the Prime Number Theorem ($\Pi(x) \sim \frac{x}{lnx}$) regarding the distribution of prime numbers on the real line.

Therefore, the Conjecture does not hold for the value $2n - 2$.

Because the initial assumption leads to a contradiction, it follows that the Conjecture is true.

I would like to thank the readers for their time and for their comments on this work, which can be sent to me at nicetovalcarcel@gmail.com