Golbach strong conjecture proof

Angel Isaac Cruz Escalante

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Abstract

Goldbach's strong conjecture states that every even number greater than two is the sum of two prime numbers, on XVIII siecle, the mathematician Christian Goldbach proposed two conjectures, the strong and weak conjecture, Goldbach's weak conjecture has been proved on 2013 and sates that every odd number is the sum of three prime numbers.

A proof for strong conjecture

Let N set of natural numbers, P set of prime numbers and C set of composite numbers, then P and C $\subset N$.We know every number greater than one is prime or composite, assuming the conjecture is false, then $\exists 2n - [P_1, P_2, P_3 ... P_k < 2n] = m \colon m \notin P$, then $n \in C$, because if $n \in P \Rightarrow m \in P$ (if $n = P_k$ then $2n - P_k = P_k$ and $m = P_k$, $\therefore m \in P$).**Hypothesis**, exist a $2n - [P_1, P_2, P_3 ... P_k < 2n] = m \colon m \in C$, then

$$[2 \prod_{P_i = P_2}^{P_k < 2n} P_i] = 2n \tag{1}$$

and

$$[\prod_{P_i = P_2}^{P_k < 2n} P_i] = n \tag{2}$$

Let $P_m! = [\prod_{P_i = P_1}^{P_m} P_i] = [(P_1)(P_2)..(P_m)]$
then

$$\frac{P_m!}{2} = n \tag{3}$$

If the hypothesis is true, then beetwen $P_m! - m$ and $P_m!$ there is not more prime numbers, and is false because $(P_m!/2) - 2$ and $(P_m!/2) + 2$ have not a common prime factor with every prime number less than m, then $(P_m!/2) - 2$ and $(P_m!/2) + 2$ are a prime numbers then $(P_m!/2) + 2 > m$(it is a contradiction), and this disprove the hypothesis, therefore Goldbach's strong conjecture is true, then $[(P_m!/2) - 2] + [(P_m!/2) + 2] = 2n$(becuase if $P_m! = a$ then$(a/2) - 2 + (a/2) + 2 = a$), Conclusion there is not a C_n with every common prime factor less than C_n, if it were true then Goldbach's strong conjecture were false.