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A Pair of Formulae to the Goldbach's Strong Conjecture

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Abstract

The Goldbach's Strong Conjecture is one of the oldest unsolved problem in number theory in Mathematics. We have created a pair of formulae to the Goldbach's strong conjecture because the statement is based with the basic concept of Mathematics. The main focus before creation was, If we can create a formula or a pair of formulae to the said conjecture, that will bring an interesting events among the students (readers) who love Mathematics, the creations will give them a huge pleasure, when they can solved, the primes whose sum are equal to the positive integer say 46,by applying our created formulae.

Keywords: Positive • Even • Integer • Sum • Two primes

Introduction

In 1742,the Prussian Mathematician Christian Goldbach's wrote a letter to Leonhard Euler in which he proposed the following conjecture. Ever even integer greater than 2can be written as the sum of three primes. He considered 1, as to be prime number , a convention abandoned. So, today Goldbach's original conjecture would be written as, every even positive number greater than 2 can be written as the sum of two primes. Goldbach's Strong Conjecture is one of the oldest and well known best unsolved problems in number theory in Mathematics It states: Every even integer greater than 2 is the sum of two primes The conjecture has been shown to hold for all integers less than 4x(10)^18, that is 4,000,000,000,000,000,000remains unproven despite considerable effort. Although every even positive integer has one or more possible ways of writing it as the sum of two primes.

2+2=4

3+3=6

3+5=8

3+7=10

5+5=10

3+47=50

7+43=50

13+37=50

19+31=50.

As simple as it seems to be, it's proof had a ways been haunting some of the very intelligent. History to proof Gold Bach's strong Conjecture: According to G.H.Hardy [1-4]. "It is comparatively easy to make clever guesses indeed there are theorems, like "Goldbach's strong conjecture "which have never been proved and which any fool could guessed. "Fever and fever offered a$1000000 prize to anyone who proved Goldbach's strong conjecture between March 20,2000 and March-20,2002.But the prize went unclaimed and the conjecture remains open. Schnirelman (1939) proved that every even number can be written as the sum of not more than three prime (Dunham 1990) which seems a rather far from for a proof for two primes. Pogorzelski (1977) claim to have proven the Goldbach's strong conjecture but his proof is not generally accepted (Shanks1985) we may think about Goldbach's Strong Conjecture.

Our perspective: we were trying to solve the Goldbach's strong Conjecture. That is the figures of the Gold Bach' Strong Conjecture attracted us Figure1.

Looking the python, what a nice picture number theory in Mathematics then we observed the figure often times, we sketched out many times the python in white papers, with the help of Scale and pencil, and also its introduction like as 4=2+2,10=3+7,10=5+5.

How can we formulate the conjecture we were so worked hard and hard to formulate it as it is originally a basic Concept of arithmetic.

We have done the pair of formulae to the Goldbach's strong conjecture,

We can give lecture and demonstration to our students in a very understanding and simple way "the Goldbach's Strong Conjecture".

Method

A pair of formulae to the Goldbach's Strong Conjecture Statement: " All positive even integers [5-15] greater than 2 can be represented as the sum of two primes."

We know that the sum of any two positive odd integers is always an even positive integer, that is if a and b are two positive odd integer.

Then, a+b=2N;2N is even.

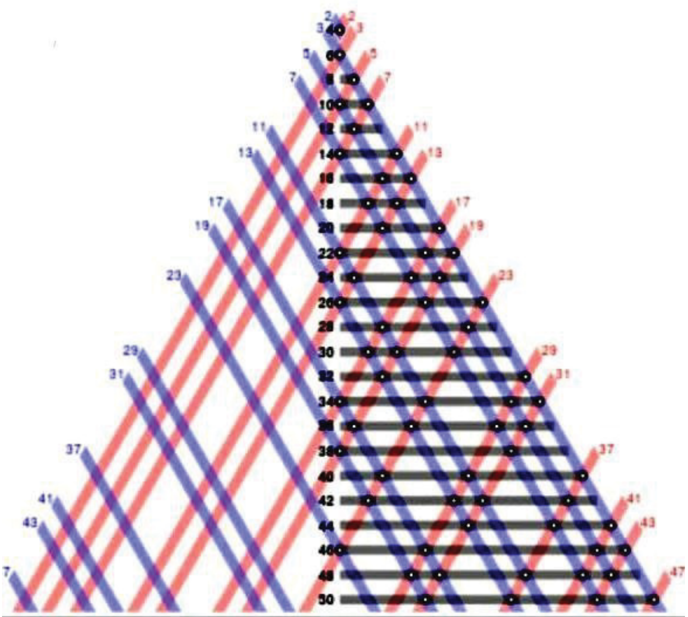

Figure 1. Looking the python, what a nice picture.

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We know that the set of positive odd integers consists of

(1)Prime

(2)Composite odd

(3)The positive odd integer 1 which is neither prime nor composite.

Now, 2N = a+b; a and b will be the positive odd integers such that If a=1, Then b=any composite odd and vice - versa

If a=1, then b=any prime3

If a=any composite odd ,then b=any composite odd If a=any composite odd, then b = any prime.

If a=any prime ,then b=any composite odd. If a=any prime, then b=any prime.

From all the above, we can accept the last one, 2N=a (any prime) +b(any prime).

Therefore, we accept the values of a and b in such a way that

- Product of a and b is greater than that of their sum, a.b>(a+b)
- gcd (a,b)=1
- LCM of a and b which is equal toa. b

Can be divided by both a and b and also divided by a, b the LCM cannot divided by any other positive odd integers.

We can try to establish such type of relation which consists of two parts

* 2N=N+N; [if N is prime number] and**2N={(2k-1)} + {(2k-1) +M+N}.

Where k is any positive integer. And {(2k-1)},{(2k-1) +M+N} both are positive odd integers such that*{(2k-1)}. {(2k-1)+M+N}>{(2k-1)}+{(2k-1)+M+N},that is,

Their product > their sum.

**gcd[(2k-1),{2k-1)+M+N}]=1.

***their LCM {(2k-1)}.{(2k-1)+M+N}

Can be divided by (2k-1)and can be divided by {(2k-l) +M+N} and also divided by LCM itself. The LCM cannot divide by any other positive odd integers.[9]

Also (2k-1) <N where N=1/2(2N) and M=2N-{(2k-1) +N+ (2k-1)}=N-2.(2k-1).

Proof: Necessary condition, R.H.S = {(2k-1)} + {(2k-1) +M+N}.

=(2k–1) + (2k–1)+N-2. (2k-1)+N

=(4k – 2) + 2N – 4k + 2

=2N

=L.H.S

Sufficient condition:

Let, P and Q are two positive odd integers which are prime[10-11]. Then (P+Q) must be a positive even integer, Say 2N

That is, 2N = P+Q [Where, P= (2k – 1) and Q= {(2k-1) +M+N}]

Thus, any positive even integer 2N can be expressed as the sum of two primes.

Now, to verify the above relation,let us take some examples-

(1). 2N=4, then N =2since 2 is prime, Therefore,We can Write, 4=2+2.

(2). 2N=6,then N=3,which is a prime number,Therefore, we can write as,6=3+3. (3).2N=8; that is N=4,which is not a prime,we have

(2k-1)<N

i.e. (2k-1) <4

I.e. 2k<5

I.e. we can take k=1,2.

If k=1 then (2k-1)=1, which is not a prime number. If k=2, Then, (2k-1)=2.2-1=3 (Prime).

M=N-2.(2k-1)=4-2.3= -2 and then, {(2k-) +M+N} = 3+ (-2) +4 = 5, which is prime. Therefore, we can write 8=3+5 [12].

(3). Another example, let the positive even integer 14, 2N=14; so that N=7 which is prime, Therefore, we can write 14 =7+7. Also, (2k-1<Ni.e (2k-1)<7i.e k<4

k=1,2,3 [we neglect k=1; as (2k-1) =1, not prime]

Now, k=2, we have (2k-1)=2.2-1=3, which is prime, M=N-2.(2k-1) =7-2.(2.2-1)=7-2.3 =1] And {(2k-l)+M+N}=3+1+7=11 (which is prime) Therefore we canwrite 14=3+11.

If k =3,Then (2k-1)=5 (which is prime) M=N-2.(2k-1)=7-2.(2.3-1)=7-10 =-3. Then, {(2k-1)+M+N}=5+(-3)+7=9, which is composite odd. Thus, 14 =7+7=3+11.

(4). Example: let the positive even integer be 46. Now, 2N=46; then N=23, which is a prime number Thus, 46=23+23 #Also, (2k-1) <N that is (2k-1) <23 Implies k<12 Thus k=1,2,3,4, 5,6,7,8,9,10,11.

If k=1, then (2k-1) =1, which is not prime. If k=2, then (2k-1)=3;

M=N-2.(2k-1)=23-2.3=17 and {(2k-1) +M+N} =3+17+23=43; Thus, 46=3+43#

If k= 3, then (2k-1)=5

M=N-2.(2k-1)=23-2.5=13 And, {(2k-1) +M+N} =5+13+23=41 Thus, 46=5+41#

If k=4, then (2k-1) =7

M=N-2.(2k-1)=23-2.7=9 And, {(2k -1) +M+N} =7+9+23=39, which his composite. If k=5, then (2k-1) =9; is composite.

If k=6,then (2k-1)=11, and M=N-2.(2k-1)=23-2.11=1 and {(2k-1) +M+N}=11+1+23=35, is composite. If k=7, then (2k-1)=13

M=N-2.(2k-1)=23-2.13=(-3). And, {(2k-1) +M+N} =13+ (- 3) +23=33, is composite.

If k=8; then (2k-1)=15, is composite.

If k=9; then (2k-1)= 17; then M=N-2.(2k-1)=23-2.17= (-11).And, {2k-1) +M+N} =17+ (-11) + 23=29.

Thus, 46=17 +29 #

If k=10, then (2k -1) =19, M=N- 2. (2k-1)=23-2. 19=(-15).And, {(2k-1) +M+N} =19+ (-15) +23=27, is

And, {(2k-1) +M+N} =5+13+23=41 Thus, 46=5+41#

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M=N-2.(2k-1)=23-2.7=9 and, {(2k-1)+M+N} =7+9+23=39, which his composite. If k=5, then (2k-1) =9; is composite.

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M=N-2.(2k-1)=23-2.13= (-3). And, {(2k-1) +M+N} =13+ (- 3) +23=33, is composite.

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Composite

If k=11, then (2k -1) =21, is composite. Therefore, we have 46=23+23. =3+43. =5+41. =17+29.

Conclusion

By the above pair of formulae, we can conclude that, "the Goldbach's strong conjecture is fully true.

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