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Even numbers are the sum of two prime numbers

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ABSTRACT

"Even numbers are the sum of two prime numbers." This is the description of Goldbach's conjecture, and in Canadian Gaye's book "unsolved problems in number theory", it is an open question to put forward a contrary conjecture that "even numbers are the difference between two prime numbers". In this paper, Chandra sieve is used to deduce that the sum of large and even numbers is the sum of two prime numbers, and that "even numbers are the difference between two prime numbers" is a great possibility. At the same time, it is possible to guess the possibility of twin prime conjecture.

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INTRODUCTION:

1. Goldbach conjecture

In Goldbach's letter to Euler in 1742, Goldbach put forward the following conjecture: any even number greater than 2 can be written as the sum of two prime numbers. But Goldbach could not prove it himself, so he wrote to consult the famous great mathematician, Euler, to help prove it, but until death, Euler could not prove it. [1] because modern mathematics has no use of "1 is also a prime number" this agreement, the original conjecture of modern statement is: any integer greater than 5 can be written as the sum of three prime numbers. Euler also put forward another equivalent version in reply, that is, any even number greater than 2 can be written as the sum of two prime numbers. The common conjecture today is represented by the version of Euler. Put the proposition "any sufficiently large, even number" can be expressed as a prime factor, the number of which does not exceed a, and the sum of the number of the other prime factors not more than B. "A+b"". In 1966, Chen Jingrun proved that "1+2" was established, namely, that any sufficiently large even number can be expressed as the sum of two prime numbers, or the sum of a prime number and 1.5 prime number". In this paper, the majority of even numbers are obtained by using the properties of Chandra sieves and their derived sieves.

2. An unsolved problem in number theory

Canada Gaye in "theory did not solve the problem of" the book "even for the two prime numbers" conjecture, also by Chandra a deduction, that there was this conjecture very large possibility of conclusion.

3. Twin prime conjecture

A twin prime is a pair of primes with a difference of 2, such as 3 and 5, 5 and 7, 11 and 13.... The conjecture was formally proposed by Hilbert in the eighth report of the 1900 International Congress of mathematicians, which can be described in this way:

There are infinitely many prime numbers P, so that P + 2 is prime.

The prime pair (P, P + 2) is called the twin prime.

In 1849, Alphonse de Polignac proposed general conjecture: all natural number k, there are infinitely many primes of (P, P + 2K). The case of k = 1 is the prime twins conjecture.

In May 14, 2013, the "nature" (Nature) magazine reported online that Zhang Yitang proved that there are infinitely many primes less than 70 million, of the difference, this study was a major breakthrough in the twin prime conjecture of this ultimate theory, some people even think that its impact on the academic circles will exceed Chen Jingrun "1+2". [1] in the new study, Zhang Yitang does not depend on the premise without proof of corollary, that there are infinitely many primes less than 70 million of the difference, and on this important issue of the twin prime conjecture, it was a big step forward.

Zhang Yitang's paper was published online in May 14th, and two weeks later, in May 28th, the constant dropped to 60 million. Only two days later, in May 31st, it dropped to 42 million. Three days later, in June 2nd, it was 13 million. The next day, 5 million. June 5th, 400 thousand. In the Polymath project sponsored by British mathematician Tim Gowers and others, the twin prime problem became a typical example of collaboration among global mathematical workers using the internet. People continue to improve the proof of Zhang Yi Tang, further closer to the final solution of the twin prime conjecture. As of October 9, 2014 (2014-10-09) [update], the prime difference is reduced to less than 246[4].

Through the Chandra sieve, we can get: twin prime conjecture is very likely to be established.

Text:

In 1934, Chandra of East India (now Bangladesh) presented a square sieve:
The first line is the first of 4, 3 of the tolerance of arithmetic sequence 4, 7, 10,... 4+3 (n-1),...
The second line is the first of 7, 5 of the tolerance of arithmetic sequence 7, 12, 17,... 7+5 (n-1),...
The third line is the first of 10, 7 of the tolerance of arithmetic sequence 10, 17, 24,... 10+7 (n-1),...
The fourth line is the first of 13, 9 of the tolerance of arithmetic sequence 13, 22, 31,... 13+9 (n-1),...
...

Line m is the first 3m+1, tolerance of arithmetic sequence 2m+1 3m+1, 5m+2, 7m+3,... Its entry n is 3m+1+ (n-1) (2m+1) =2mn+m+n,...

Write the following array:

	First columns	second columns	third columns	fourth columns	fifth columns	…	Column n	…
First lines	4	7	10	13	16	…	4+3(n-1)	…
Second lines	7	12	17	22	27	…	7+5(n-1)	…
Third lines	10	17	24	31	38	…	10+7(n-1)	…
Fourth lines	13	22	31	40	49	…	13+9(n-1)	…
Fifth lines	16	27	38	49	60	…	16+11(n-1)	…
…	…	…	…	…	…	…	…	…
Line m	3m+1	5m+2	7m+3	9m+4	11m+5	…	2mn+m+n	…
…	…	…	…	…	…	…	…	…

The secret of this square screen is that if a natural number N appears in the table, then 2N + 1 is certainly not prime; if N does not appear in the table, then 2N + 1 is definitely prime.

In fact, if N=2mn+m+n, then 2N+1=2 (2mn+m+n) +1=4mn+2m+2n+1= (2m+1) (2n+1), is not prime. On the other hand, if N is not present in the table, if 2N+1 is not prime, then 2N+1 must be the product of two odd numbers, write 2N+1= (2m+1) (2n+1) =4mn+2m+2n+1, and get N=2mn+m+n, which appears in the table and conflicts with the hypothesis. So when N does not appear in the matrix, 2N+1 must be the prime number.

A number of similar matrices (Simplified) are then deduced, and numerous matrices of the same nature are found. After the deduction of this matrix, there will be many wonderful phenomena, and there are many effective applications.

5811141720......... .
81318232833......... .
111825323946......... .
....

This matrix in some natural number N that appears in the matrix of 2N - 1 is certainly not prime, if there is 2N - 1, it must be prime, because the first 5 matrix does not appear, the second matrix 6 does not appear and also the 2 * 5+1=2 * 6 - 1.

Similarly, we can list a matrix:

69121518......... .
914192429......... .
1219263340......... .
....

It can be concluded that if the natural number N appears in this matrix, the 2N - 3 is certainly not prime. If it does not appear, the 2N - 3 must be the prime number, and the truth is the same as above.

It may also be listed:

4+x, 7+x, 10+x, 13+x......... .
7+x 12+x 17+x 22+x......... .
10+x 17+x 24+x 31+x......... .
....

It can be concluded that if the natural number N appears in the matrix, then 2N - (2x - 1) must not be a prime number. If not, then 2N - (2x - 1) must be prime.

"Any one even greater than 2 can be expressed as the sum of two prime numbers", this is in the famous Goldbach conjecture, Canada Gaye in the book "unsolved problems in number theory". In this book, a similar conjecture is obtained, " instead of any even number can be expressed as two primes, for subtraction" for example: 2=5-3,4=7-3,6=11-5,8=11-3,10=13-3......

The moments corresponding to the matrix at the beginning of the "" are 2N-1, 2n-3, 2n-5, 2n-7, 2n-9, 2n-11, 2n-13...

When n does not appear in the matrix at the beginning of 4, 2n+1 is the prime number; when n does not appear in the matrix at the beginning of 4 and 5, 2n+1 and 2N-1 are prime numbers, so 2= (2n+1) - (2n-1) = prime - prime number.

When n does not appear in the matrix at the beginning of 4, 2n+1 is the prime number; when n does not appear in the matrix at the beginning of 4 and 6, 2n+1 and 2n-3 are prime numbers, 4= (2n+-1) - (2n-3) = prime number - prime number.

At the same time and so on, if it does not appear in the matrix and 4 4+x at the beginning of the N, 2n+1 and 2n (2x1) are prime numbers, this time 2x= (2n+1) - (2n-2x+1), apparently 2x can be all even.

As long as any sieve and the beginning of the 4 screen has a n at the same time, this conjecture was established, each one has an infinite number of screen and does not appear, so at least the same possibility is very large, so this conjecture has established the possibility of a very large occurrence!

If it does not appear in 6, 7, 8, 10, 11...... The natural numbers n, 2n, minus 3, 5, 7, 11, 11, and 13 (must be minus prime numbers) results in prime numbers, and these 2n are all prime numbers plus 3, 5, 7, and two...... It is a prime number with a prime number. All natural numbers do not appear in the screen twice and contain the great majority of even numbers. Even number is the sum of two prime numbers, so the great majority of even number is the sum of two prime numbers.

In addition: The natural number N of the matrix at the beginning of 5 corresponds to 2N - 1, and the natural number N of the matrix at the beginning of 6 corresponds to 2N - 3, then 7, 8, 9...... The natural number N of the initial matrix corresponds to 2N - 5,2N - 7,2N - 9, 2N - 11......

Now, there are 4 cases:

A 2N – Prime＝prime
B 2N – prime＝Composite
C 2N – compotation＝Prime
D 2N – compotation＝compotation

All 2N A, B includes all even odd prime number, prime number + + get prime;

All 2N C in D, including all the even odd prime number, odd number + + odd number obtained.

The 2N in A and B includes all the odd numbers plus 3, 5, 7, 11,...... The even numbers obtained by prime numbers, 2N in C and D, include all odd numbers plus 9, 15, 21...... Odd numbers are even,

All odd numbers +3, all odd numbers +9, even numbers, large, even numbers.
All odd numbers +5, all odd numbers +15, even numbers, large, even numbers.
All odd numbers +7, all odd numbers +21, even numbers, large, even numbers.
....

That is to say, the 2N in A, B, and 2N in C and D are the same in large and even numbers.
The 2N in A and B removes the 2N in B, the 2N in C and D, removes the 2N in C, and the remaining large, even

numbers of 2N are the same, because the 2N in B and C are the same, the reason:

B: 2N= + C:2N= + prime number, prime number.

So A, B and C, D in 2N, remove the same part of even numbers, the remaining large, even number, or the same.

D 2N is the number + even number, all less than 40 even can be expressed as odd number with odd number, reason:

The number of N bits must be 0, 2, 4, 6, 8, and now the n is numerically classified:

(1) if a digit n is 0, n=15+5k (k = 5 for odd);
(2) if a digit n is 2, n=27+5k (k = 3 for odd);
(3) if a digit n is 4, n=9+5k (k = 7 for odd);
(4) if a digit n is 6, n=21+5k (k = 5 for odd);
(5) if a digit n is 8, n=33+5k (k = 3 for odd);

To sum up, not less than any even number 40, can be expressed as two and the odd number.

Therefore D 2N contains all the even numbers greater than 40, including all the large even, all A in 2N also includes all the even numbers greater than 40, the A 2N is a prime + prime, so all the large even number is the sum of two prime numbers. Twin prime number conjecture is a famous unsolved problem in number theory. The conjecture was formally proposed by Hilbert in the eighth report of the 1900 International Congress of mathematicians, it ranked 23 in the "Hilbert problem", and it describes "the existence of infinite primes P, and for each P, p+2 this is a prime number".

If there is no other interference between the two adjacent natural numbers in the first row of the Chandra sieve, there are countless adjacent natural numbers, and their 2 and 1 are twin prime numbers. But the second and third lines......, it is difficult to completely cover the first line, so the twin prime conjecture is very likely to be established.

CONCLUSION:

1. For Goldbach's conjecture, even numbers are the sum of two prime numbers, and most even numbers are the sum of two prime numbers;
2. "Even numbers are the difference between two prime numbers" is a great possibility;
3. Twin prime conjecture is very likely to be established.

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