Twin Prime Conjecture

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Abstract

I proved the Twin Prime Conjecture.

The probability that (6n-1) is prime and (6n+1) is also prime is $\frac{4}{3}$ times the simple square of the probability that a prime number appears. Investigated up to 70 million.

All Twin Primes are executed in hexadecimal notation. It does not change in a huge number (forever huge number).

In the hexagon, prime numbers are generated only at (6n -1)(6n+1). [n is a positive integer]

If the number is very large, the probability of generating a prime number is low, but since the prime number exists forever, the probability of generating a twin prime number is very low, but a twin prime number is produced.

That is, twin primes exist forever.

key words

Hexagonal circulation, Twin Prime, 4/3 times the simple square of the probability

Introduction

In this paper, it is written in advance that 2 and 3 are omitted from prime numbers.

The prime number is represented as (6n -1) or (6n+1). And, n is positive integer.

All Twin Primes are combination of (6n -1) and (6n+1).
That is, all Twin Primes are a combination of 5th angle and 1th angle.

[n is positive integer]

1th angle is (6n+1).
5th angle is (6n -1).

(6n -2), (6n), (6n+2) in are even numbers.
(6n -1), (6n+1), (6n+3) are odd numbers.

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Prime numbers are (6n -1) or (6n+1). Except 2 and 3. [n is positive integer].
The following is a prime number.
There are no prime numbers that are not (6n -1) or (6n+1).
5 ——— 6n -1 (Twin prime)
7 ——— 6n+1
11 ——— 6n -1 (Twin prime)
13 ——— 6n+1
17 ——— 6n -1 (Twin prime)
19 ——— 6n+1
23 ——— 6n -1
29 ——— 6n -1 (Twin prime)
31 ——— 6n+1
....
....

There are 166 prime numbers from 5 to 1000. Probability is $\frac{166}{996}$.
In this, there are 33 twin prime numbers. Probability is $\frac{33}{996}$=0.03313253...
and $[\frac{166}{996}]^2 \times \frac{6}{5} = 0.0333333...$

There are 3536 prime numbers from 5 to 33000.
Probability is $\frac{3536}{32996}$.
In this, there are 455 twin prime numbers. Probability is $\frac{455}{32996}$=0.0137895502485...
and $[\frac{3536}{32996}]^2 \times \frac{6}{5} = 0.0137810773...$

There are 5131 prime numbers from 5 to 50000.
Probability is $\frac{4673}{49996}$.
In this, there are 690 twin prime numbers. Probability is $\frac{690}{49996}$ =0.0138011040883...
and $[\frac{5131}{49996}]^2 \times \frac{5}{4}$=0.0131656869... $[\frac{5131}{49996}]^2 \times \frac{4}{3}$=0.0140433993...

There are 9590 prime numbers from 5 to 100000.
Probability is $\frac{9590}{99996}$.
In this, there are 1222 twin prime numbers. Probability is $\frac{1222}{99996}$=0.0122204888...
and $[\frac{9590}{99996}]^2 \times \frac{4}{3}$=0.0122633943...

There are 17982 prime numbers from 5 to 200000.
Probability is $\frac{17982}{199996}$.
In this, there are 2158 twin prime numbers. Probability is $\frac{2158}{199996}$=0.010790215804316...
and $[\frac{17982}{199996}]^2 \times \frac{4}{3}$=0.01077884...

There are 25995 prime numbers from 5 to 300000.

Probability is $\frac{25995}{299996}$.
In this, there are 2992 twin prime numbers. Probability is $\frac{2993}{299996}$=0.00997679969...
and $[\frac{25995}{299996}]^2 \times \frac{4}{3}$=0.01001123......

There are 33858 prime numbers from 5 to 400000.
Probability is $\frac{33858}{399996}$.
In this, there are 3802 twin prime numbers. Probability is $\frac{3803}{399996}$=0.009505095...
and $[\frac{33858}{399996}]^2 \times \frac{4}{3}$=0.00955322...

There are 41536 prime numbers from 5 to 500000.
Probability is $\frac{41536}{499996}$.
In this, there are 4564 twin prime numbers. Probability is $\frac{4564}{499996}$=0.009128073...
and $[\frac{41536}{499996}]^2 \times \frac{4}{3} = 0.009201423...$

There are 49096 prime numbers from 5 to 600000.
Probability is $\frac{49096}{599996}$.
In this, there are 4564 twin prime numbers. Probability is $\frac{5330}{599996}$=0.00888339255595...
and $[\frac{49096}{599996}]^2 \times \frac{4}{3}$=0.0089275902...

There are 56540 prime numbers from 5 to 700000.
Probability is $\frac{56540}{699996}$.
In this, there are 6060 twin prime numbers. Probability is $\frac{6060}{699996}$=0.008657192...
and $[\frac{56540}{699996}]^2 \times \frac{4}{3}$=0.00869879...

There are 63948 prime numbers from 5 to 800000.
Probability is $\frac{63948}{799996}$.
In this, there are 6765 twin prime numbers. Probability is $\frac{6765}{799996}$=0.00845629228...
and $[\frac{63948}{799996}]^2 \times \frac{4}{3}$=0.0085195574...

There are 71272 prime numbers from 5 to 900000.
Probability is $\frac{71272}{899996}$.
In this, there are 7471 twin prime numbers. Probability is $\frac{7471}{899996}$=0.0083011480051...
and $[\frac{71272}{899996}]^2 \times \frac{4}{3} = 0.00836171709...$

There are 78496 prime numbers from 5 to 1000000=1×10^6.
Probability is $\frac{78496}{999996}$.
In this, there are 8168 twin prime numbers. Probability is $\frac{8168}{999996}$=0.008168032672...
and $[\frac{78496}{999996}]^2 \times \frac{4}{3}$=0.0082155617...

There are 148931 prime numbers from 5 to 2000000=2×10^6.
Probability is $\frac{148931}{1999996}$.
In this, there are 14870 twin prime numbers. Probability is $\frac{14870}{1999996}$=0.0074350148...
and $[\frac{148931}{1999996}]^2 \times \frac{4}{3}$=0.00739351...

There are 216814 prime numbers from 5 to 3000000=3×10^6.
Probability is $\frac{216814}{2999996}$.
In this, there are 20931 twin prime numbers. Probability is $\frac{20931}{2999996}$=0.0069770093...
and $[\frac{216814}{2999996}]^2 \times \frac{4}{3}$=0.006964212...

There are 283144 prime numbers from 5 to 4000000=4×10^6.
Probability is $\frac{216814}{3999996}$.
In this, there are 26859 twin prime numbers. Probability is $\frac{26859}{3999996}$=0.0067147567...
and $[\frac{283144}{3999996}]^2 \times \frac{4}{3}$=0.006680890...

There are 348511 prime numbers from 5 to 5000000=5×10^6.
Probability is $\frac{348511}{4999996}$.
In this, there are 32462 twin prime numbers. Probability is $\frac{32462}{4999996}$=0.00649240519...
and $[\frac{348511}{4999996}]^2 \times \frac{4}{3}$=0.006477872...

There are 412847 prime numbers from 5 to 6000000=6×10^6.
Probability is $\frac{412847}{5999996}$.
In this, there are 37915 twin prime numbers. Probability is $\frac{37915}{5999996}$=0.00631917087...
and $[\frac{412847}{5999996}]^2 \times \frac{4}{3}$=0.0063126989...

There are 476646 prime numbers from 5 to 7000000=7×10^6.
Probability is $\frac{476646}{6999996}$.
In this, there are 43258 twin prime numbers. Probability is $\frac{43258}{6999996}$=0.006179717816...
and $[\frac{476646}{6999996}]^2 \times \frac{4}{3}$=0.0061820862...

There are 539775 prime numbers from 5 to 8000000=8×10^6.
Probability is $\frac{539775}{7999996}$.
In this, there are 48617 twin prime numbers. Probability is $\frac{48617}{7999996}$=0.006077128038...
and $[\frac{539775}{7999996}]^2 \times \frac{4}{3}$=0.0060699446...

There are 602487 prime numbers from 5 to 9000000=9×10^6.
Probability is $\frac{602487}{8999996}$.
In this, there are 53866 twin prime numbers. Probability is $\frac{53866}{8999996}$=0.00598511377...
and $[\frac{602487}{8999996}]^2 \times \frac{4}{3}$=0.005975158...

There are 664577 prime numbers from 5 to 10000000=1×10^7.
Probability is $\frac{664577}{9999996}$.
In this, there are 58979 twin prime numbers. Probability is $\frac{58979}{9999996}$=0.0058979023...
and $[\frac{664577}{19999996}]^2 \times \frac{4}{3} = 0.005888839...$

There are 1270605 prime numbers from 5 to 20000000=2×10^7.
Probability is $\frac{1270605}{19999996}$.
In this, there are 107406 twin prime numbers. Probability is $\frac{107406}{19999996}$=0.005370301...
and $[\frac{1270605}{19999996}]^2 \times \frac{4}{3}$=0.005381459...

There are 1857857 prime numbers from 5 to 30000000=3×10^7.
Probability is $\frac{1857857}{29999996}$.
In this, there are 152891 twin prime numbers. Probability is $\frac{152891}{29999996}$=0.0050963673...
and $[\frac{1857857}{29999996}]^2 \times \frac{4}{3}$=0.0051135311...

There are 2433652 prime numbers from 5 to 40000000=4×10^7.
Probability is $\frac{2433652}{39999996}$.
In this, there are 196752 twin prime numbers. Probability is $\frac{196752}{39999996}$=0.00491880049...
and $[\frac{2433652}{39999996}]^2 \times \frac{4}{3}$=0.0049355527...

There are 3001132 prime numbers from 5 to 50000000=5×10^7.
Probability is $\frac{3001132}{49999996}$.
In this, there are 239100 twin prime numbers. Probability is $\frac{239100}{49999996}$=0.00478200038...
and $[\frac{3001132}{49999996}]^2 \times \frac{4}{3}$=0.00480362385...

There are 3562112 prime numbers from 5 to 60000000=6×10^7.
Probability is $\frac{3562112}{59999996}$.
In this, there are 280557 twin prime numbers. Probability is $\frac{280557}{59999996}$=0.00478200038...
and $[\frac{3562112}{59999996}]^2 \times \frac{4}{3}$=0.00469949762...

There are 4118061 prime numbers from 5 to 70000000=7×10^7.
Probability is $\frac{4118061}{69999996}$.
In this, there are 321465 twin prime numbers. Probability is $\frac{321465}{69999996}$=0.0045923574...
and $[\frac{4118061}{69999996}]^2 \times \frac{4}{3}$=0.00461453832...

There are 4669380 prime numbers from 5 to 80000000=8×10^7.
Probability is $\frac{4669380}{79999996}$.
In this, there are 361449 twin prime numbers. Probability is $\frac{361449}{79999996}$=0.0045181127...
and $[\frac{4669380}{79999996}]^2 \times \frac{4}{3}$=0.00454231...

There are 5216951 prime numbers from 5 to 90000000=9×10^7.
Probability is $\frac{5216951}{89999996}$.
In this, there are 401089 twin prime numbers. Probability is $\frac{401089}{89999996}$=0.0044565446...
and $[\frac{5216951}{89999996}]^2 \times \frac{4}{3}$=0.0044800954...

There are 5761453 prime numbers from 5 to 100000000=1×10^8.
Probability is $\frac{5761453}{99999996}$.
In this, there are 440311 twin prime numbers. Probability is $\frac{440311}{99999996}$=0.004403110176...
and $[\frac{5761453}{99999996}]^2 \times \frac{4}{3}$=0.0044259124...

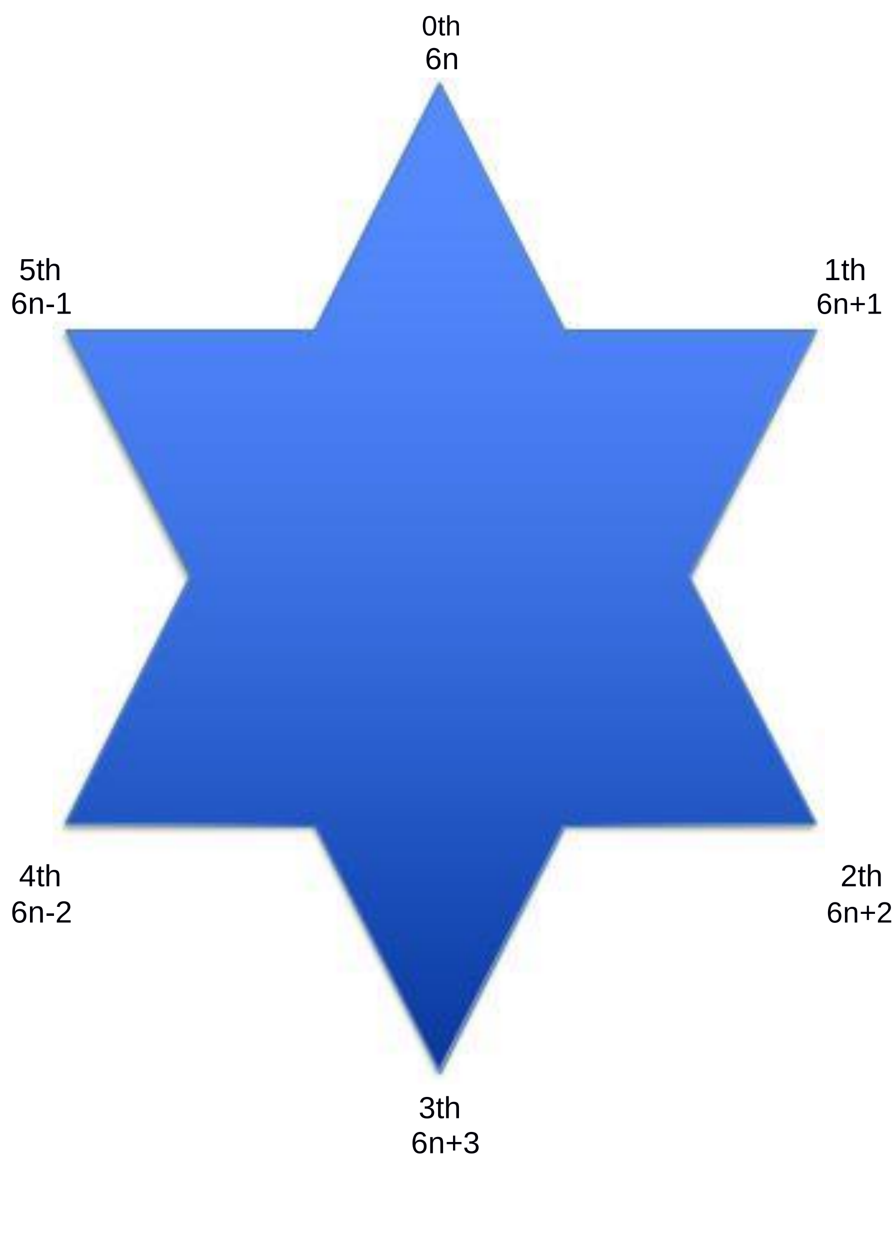
There are 11078935 prime numbers from 5 to 200000000=2×10^8.
Probability is $\frac{11078935}{199999996}$.
In this, there are 813370 twin prime numbers. Probability is $\frac{813370}{199999996}$=0.004066850081...
and $[\frac{11078935}{199999996}]^2 \times \frac{4}{3}$=0.0040914268...

There are 16252323 prime numbers from 5 to 300000000=3×10^8.
Probability is $\frac{16252323}{299999996}$.
In this, there are 1166479 twin prime numbers. Probability is $\frac{1166479}{299999996}$=0.00388826338...
and $[\frac{16252323}{299999996}]^2 \times \frac{4}{3}$=0.00391315570...

I want to search even larger numbers, but I think this is enough for the proof, and the numerical calculation ends here.

At first, the correction value was set to $\frac{6}{5}$=1.2.
Eventually, the correction value was $\frac{5}{4}$=1.25.
And the correction value is $\frac{4}{3} = 1.33333....$
It is obvious that this correction value is $\frac{4}{3}$.

Calculation depends on WolframAlpha and Wolfram Cloud.


0th
6n
1th
6n+1
2th
6n+2
3th
6n+3
4th
6n-2
5th
6n-1

Discussion

First, say 6n -1 = 6n+5

$(6n-1) \times 5$ =6(5n -1)+1= 1th-angle.
$(6n+1) \times 5$ =6(5n)+5= 5th-angle.
and
$(6n-1) \times 7$ =6(7n -2)+5= 5th-angle.
$(6n+1) \times 7$ =6(7n+1)+1= 1th-angle.
and
$(6n-1) \times 11$ =6(11n -2)+1= 1th-angle.
$(6n+1) \times 11$ =6(11n+1)+5= 5th-angle.
and
$(6n-1) \times 13$ =6(13n -3)+5= 5th-angle.
$(6n+1) \times 13$ =6(13n+2)+1= 1th-angle.
and
$(6n-1) \times 17$ =6(17n -3)+1= 1th-angle.
$(6n+1) \times 17$ =6(17n+2)+1= 5th-angle.
and
$(6n-1) \times 19$ =6(19n -4)+5= 5th-angle.
$(6n+1) \times 19$ =6(19n+3)+1= 1th-angle.
and
$(6n-1) \times (6n-1) = 6(6n^2$ -2n)+1= 1th-angle.
$(6n-1) \times (6n+1) = 6(6n^2$ -1)+5= 5th-angle.
and
$(6n+1) \times (6n-1) = 6(6n^2$ -1)+5= 5th-angle.
$(6n+1) \times (6n+1) = 6(6n^2$+2n)+1= 1th-angle.

In this way, prime multiples of 5 or 7 or more of prime numbers fill 1th angle, 5th angle, and the location of prime numbers becomes narrower.

However, every time the hexagon is rotated once, the number of locations where the prime number exists increases by two.

But, the number of prime numbers increases as the number increases, the narrowing of the gorge is severe with large numbers.
The narrowing becomes very strong as the number grows.

The probability that (6n -1)(6n+1) combinations exist is $\frac{4}{3}$ times the square of the probability of obtaining one prime number by rotating the hexagon once.

The probability of a twin prime number is obtained by multiplying the square of the probability of a prime number by [4/3].

Considering a hexagon, the twin prime number can be considered as (6n -1)(6n+1).
At the beginning, [6/5] was sufficient as the correction value, but gradually became [5/4] and [4/3].

The probability that (6n -1)(6n+1) combinations exist becomes very low when the number is huge.
It probability is very close to 0, but greater than 0.

The narrowing of the generation of prime numbers cannot fill all the locations of prime numbers, that is, (6n -1)(6n+1).
Because prime numbers exist forever.

The probability that a twin prime will occur is less likely to occur because it is $\frac{4}{3}$ times the square of the probability that a prime will occur in a huge number, where the probability that a prime will occur is low from the equation (1).
while a prime number is generated, it can be generated.

$$\pi(x) \sim \frac{x}{\log x} \quad (x \to \infty) \tag{1}$$

That is, twin primes exist forever.

Proof end.

References

[1] B.Riemann.: Uber die Anzahl der Primzahlen unter einer gegebenen Grosse, Mon. Not. Berlin Akad pp.671-680, 1859

[2] John Derbyshire.: Prime Obsession: Bernhard Riemann and The Greatest Unsolved Problem in Mathematics, Joseph Henry Press, 2003

[3] S.Kurokawa.: Riemann hypothesis, Japan Hyoron Press, 2009

[4] Marcus du Sautoy.: The Music of The Primes, Zahar Press, 2007

[5] S.Saitoh.: Fundamental of Mathematics; Division by Zero Calculus and a New Axiom, vixra:1908.0100

[6] T.Takami.: Goldbach's Conjecture, viXra:1808.0531

Postscript

I thank Professor.S.Saito for his many advices.
And fried-turnip's Yahoo Answers, for a Wolfram Cloud program that you have me tell you, the last of the stuffing was able at once.
Thanks to fried-turnip, it was decided whether 4/3 would be a constant.

added

The fact that twin primes exist forever was easily broken, but a new problem called the mystery of the constant [4/3] occurred.

This cannot be explained by (6n -1)(6n -1), (6n -1)(6n+1) ... which I showed in the previous paper.

There are four possible primes, (6n -1)(6n -1), (6n -1)(6n+1), (6n+1) (6n -1), (6n+1)(6n+1), each with the same probability.
At this time, the twin prime is only (6n -1) (6n+1).
The probability of (6n -1) (6n+1) is 1/4.

That is, when a prime number comes out, the probability that it is a twin prime number is the inverse 4/3 of [1- (1/4) = 3/4].
This is the reason for the constant 4/3.

But I don't think this logic holds true.
Therefore, I am currently thinking hard about the mystery of the coefficient [4/3], but I don't know.

I think this should not be included in the paper, so I removed it from the paper and wrote it here.

Does the twin prime number problem exist forever? Is a problem, and the coefficient [4/3] is not a problem. However, this coefficient [4/3] may be a new problem.

This is (4n -1)(4n+1), (8n -1)(8n+1), (12n -1)(12n+1), (16n -1) (16n+1), (18n -1)(18n+1), (24n -1)(24n+1), etc., and they are troubled because they cannot be explained as quadrangular, octagonal, dodecagonal, hexagonal, 18gonal, or 24-gonal.
Also, if you look closely, the calculation stopped because the memory was full at 300 million, but it seems to be showing a slightly lower value than [4/3].
That is, it may be slightly lower than [4/3]=1.333333....

I had noticed that [6/5] changed to [5/4] and then [4/3] since counting up to 200,000 by hand.
And I thought that [4/3] = 1.33333 .... would increase further, but tens of millions of twin primes in Wolfram cloud that find up to 300 million, [4/3] = 1.33333 ... knew that it will not increase.
It was fried-turnip of Yahoo! Wisdom Bag that made me realize that it will stop in [4/3].
I never knew that Wolfram Cloud could easily find tens of millions of twin primes.

I printed a prime number table up to 200,000, and calculated the number of primes and the number of twin primes by hand.
The number of prime numbers can be easily obtained with WolframAlpha, I knew it after calculated on paper by hand the number of primes of 200,000.
It was very difficult just to calculate the number of twin prime on paper.

However, fried-turnip in Yahoo! Wisdom Bag was stunned to know that the number of twin primes can be easily obtained with Wolfram Cloud.
This also allowed me to find the number of twin primes up to 300 million.
Is the number of twin primes correct at the beginning?
I checked it against the number I calculated by hand, and I confirmed it, but now I don't think it is wrong.

Re-added

In my personal opinion, Mr. fried-turnip from Yahoo! Chiebukuro is an advisor for electricity related when I was looking for make a time machine.
I think he did not knows that I was making a time machine.
(Note that this is a Google translation, and I don't understand English at all.)

I was very weak at English, and I only studied English in junior high school, but English was always the lowest score.
I was studying English during my math class.
Therefore, when it is translated from Japanese to English by Google translation, it changes to encryption.
In other words, please understand that I do not know what I are writing.