Twin Prime Conjecture

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Abstract

I proved the Twin Prime Conjecture.

The probability that (6n -1) is a prime and (6n+1) is also a prime approximately is 6/5 times the square of the probability that a prime will appear in.

I investigated up to 1×10^{11}.

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

In the hexagon, prime numbers are generated only at (6n -1)(6n+1). [except 2 and 3, n is a positive integer]

When the number grows to the limit, the denominator of the expression becomes very large, and primes occur very rarely, but since twin primes are the square of the distribution of primes, the frequency of occurrence of twin primes is very equal to 0.

However, it is not 0. Therefore, twin prime continue to be generated.

That is, twin primes exist forever.

key words

Hexagonal circulation, Twin Primes, the square of the distribution of primes

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.

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[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.

Prime numbers are (6n -1) or (6n+1).
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
....
....

Part 1

There are 164 prime numbers from 5 to 1000.
Probability is $\frac{164}{996}$.
In this, there are 34 twin prime numbers. Probability is $\frac{34}{996}$ =0.034136546...
and $[\frac{164}{996}]^2 \times \frac{5}{4}$=0.0338905824...
$[\frac{164}{996}]^2 \times \frac{4}{3}$=0.0361499546...

There are 299 prime numbers from 5 to 2000.
Probability is $\frac{299}{1996}$.
In this, there are 60 twin prime numbers. Probability is $\frac{60}{1996}$ =0.030060120...
and $[\frac{299}{1996}]^2 \times \frac{4}{3}$=0.0299198932...

There are 426 prime numbers from 5 to 3000.
Probability is $\frac{426}{2996}$.
In this, there are 81 twin prime numbers. Probability is $\frac{81}{2996}$ =0.027036048...
and $[\frac{426}{2996}]^2 \times \frac{4}{3}$=0.026957171...

There are 665 prime numbers from 5 to 5000.
Probability is $\frac{665}{9996}$.

In this, there are 125 twin prime numbers. Probability is $\frac{125}{4996}$ =0.025020016...
and $[\frac{665}{4996}]^2 \times \frac{4}{3}$=0.023623115...

There are 1227 prime numbers from 5 to 10000.
Probability is $\frac{1227}{29996}$.
In this, there are 204 twin prime numbers. Probability is $\frac{204}{9996}$ =0.02040816326...
and $[\frac{1227}{9996}]^2 \times \frac{4}{3}$=0.0200897886...

There are 2258 prime numbers from 5 to 20000.
Probability is $\frac{2258}{29996}$.
In this, there are 340 twin prime numbers. Probability is $\frac{340}{19996}$ =0.01700340068...
and $[\frac{2258}{19996}]^2 \times \frac{4}{3}$=0.017002013...

There are 3243 prime numbers from 5 to 30000.
Probability is $\frac{3243}{29996}$.
In this, there are 465 twin prime numbers. Probability is $\frac{465}{29996}$ =0.01550206694...
and $[\frac{3243}{29996}]^2 \times \frac{4}{3}$=0.015584969...

There are 6053 prime numbers from 5 to 60000.
Probability is $\frac{6053}{59996}$.
In this, there are 809 twin prime numbers. Probability is $\frac{809}{59996}$ =0.01348423228....
and $[\frac{6053}{59996}]^2 \times \frac{4}{3}$=0.013571738...

There are 6931 prime numbers from 5 to 70000.
Probability is $\frac{6931}{69996}$.
In this, there are 904 twin prime numbers. Probability is $\frac{904}{69996}$ =0.012915023716...
and $[\frac{6931}{69996}]^2 \times \frac{4}{3}$=0.0130732657...

There are 6933 prime numbers from 5 to 90000.
Probability is $\frac{6933}{89996}$.
In this, there are 903 twin prime numbers. Probability is $\frac{903}{69996}$ =0.012900737185...
and $[\frac{6933}{69996}]^2 \times \frac{4}{3}$=0.01308081164...

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 $\frac{2158}{199996}$=0.0107902...
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 $1000000=1\times10^6$.
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 $2000000=2\times10^6$.
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 $3000000=3\times10^6$.
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 $4000000=4\times10^6$.
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 $5000000=5\times10^6$.
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 $6000000=6\times10^6$.
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 $7000000=7\times10^6$.
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 $8000000=8\times10^6$.
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 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 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 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 $\frac{361449}{79999996}$=0.00451811272...
and $[\frac{4669380}{79999996}]^2 \times \frac{4}{3}$=0.00454231495...

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...

There are 50847530 prime numbers from 5 to 1000000000=1×10^9.
Probability is $\frac{50847530}{999999996}$.
In this, there are 3424505 twin prime numbers. Probability is $\frac{3424505}{999999996}$=0.00342450501...
and $[\frac{50847530}{999999996}]^2 \times \frac{4}{3}$=0.00344729510371...

There are 455052507 prime numbers from 5 to 1000000000=1×10^{10}.
Probability is $\frac{455052507}{9999999996}$.
In this, there are 27412678 twin prime numbers. Probability is $\frac{27412678}{9999999996}$=0.0027412678...
and $[\frac{455052507}{9999999996}]^2 \times \frac{4}{3}$=0.0027609704572...

There are 4118054809 prime numbers from 5 to 10000000000=1×10^{11}.
Probability is $\frac{4118054811}{99999999996}$.
In this, there are 224376047 twin prime numbers. Probability is $\frac{224376047}{99999999996}$=0.002243760...
and $[\frac{4118054811}{99999999996}]^2 \times \frac{4}{3} = 0.0022611167237...$

Part 2

There are 455052507-50847530=404204977 prime numbers from 1×10^9 to $1 \times 10^{10} = 9 \times 10^9$.
Probability is $\frac{404204977}{9000000000}$.
In this, there are 27412678-3424505=23988173 twin prime numbers. Probability is $\frac{23988173}{9000000000}$=0.00266535255...

$[\frac{404204977}{9000000000}]^2 \times \frac{4}{3}$=0.00268941009764...

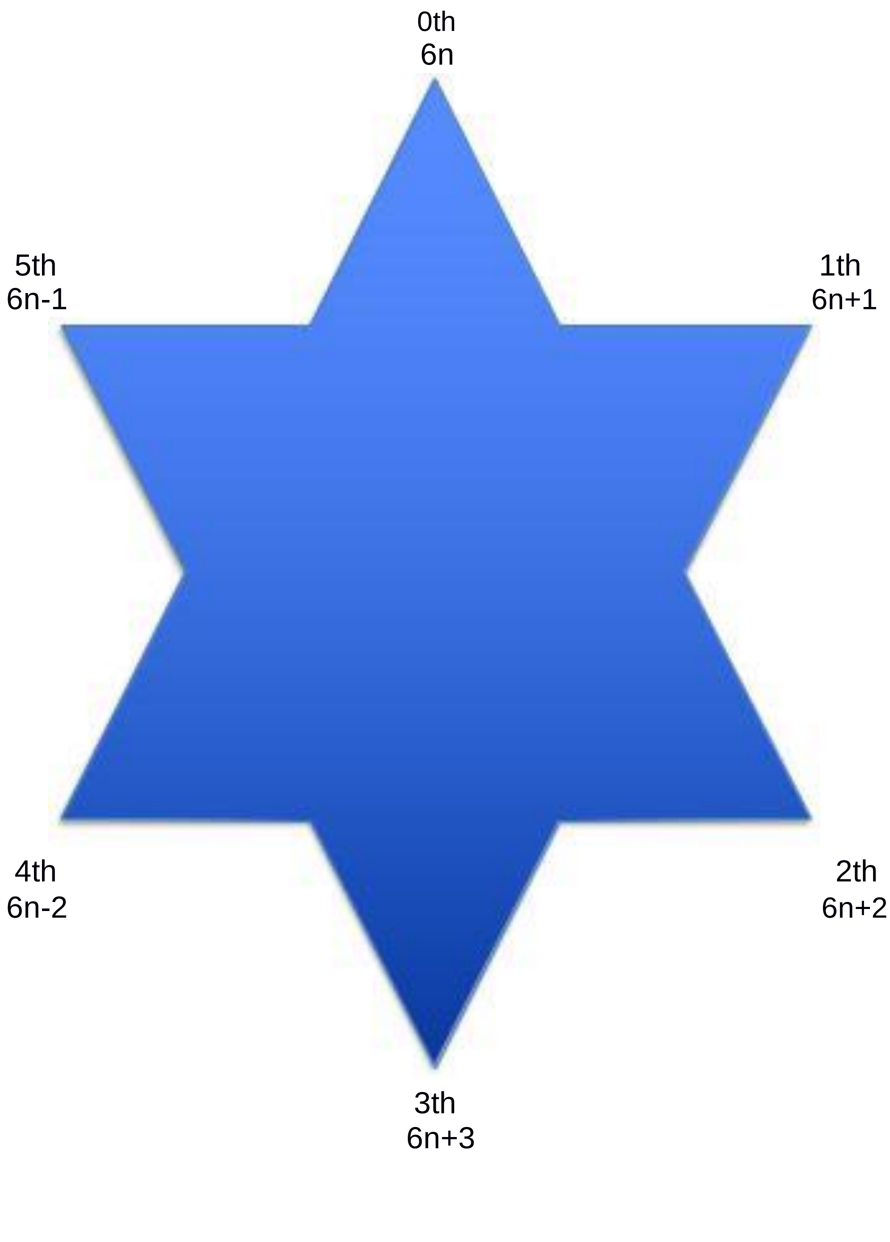
There are 4118054809-455052507=3663002302 prime numbers from 1×10^{10} to 1×10^{11}=9×10^{10}.
Probability is $\frac{3663002302}{90000000000}$=0.0407000255777....
In this, there are 224376047-50847530=173528517 twin prime numbers. Probability is $\frac{173528517}{90000000000}$=0.0019280946333...

$[\frac{3663002302}{90000000000}]^2 \times \frac{6}{5}$=0.001987790498438...
and
$[\frac{3663002302}{90000000000}]^2 \times \frac{7}{6}$=0.00193257409570...

At first, the correction value was set to 5/4.
And the correction value is 4/3.
Continuing further, the correction value is 7/6.
Continuing further, the value is expected to be 1.

(It was done by hand calculation up to 200,000, but at this time it was [6/5] at first, gradually moved to [5/4], and then moved to [4/3].
At that time, I didn't know that WolframAlpha and Wolfram Cloud could calculate prime numbers and twin prime numbers.)

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)$\times(6n+1) = 6(6n^2-1)+5 = 6(6n^2)-1=$ 5th-angle.
and
$(6n+1)\times(6n-1) = 6(6n^2-1)+5 = 6(6n^2)-1=$ 5th-angle.
(6n+1)$\times(6n+1) = 6(6n^2$+2n)+1= 1th-angle.

In this way, prime multiples of (6n -1) or (6n+1) of prime numbers fill 5th-angle, 1th-angle, and the location of prime numbers becomes little by little narrower.

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

The probability of a twin prime[(6n -1)(6n+1) combinations] is obtained by multiplying 6/5 times the square of the probability of a prime will occur.

The probability that a twin prime will occur 6/5 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, twin primes be generated.

And, as can be seen from the equation below, even if the number becomes large, the degree of occurrence of prime numbers only decreases little by little.

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

$\log(10^{20}) = 20\log(10) \approx 46.0517018$
$\log(10^{200}) = 200\log(10) \approx 460.517018$
$\log(10^{2000}) = 2000\log(10) \approx 4605.17018$
$\log(10^{20000}) = 20000\ \log(10) \approx 46051.7018$
$\log(10^{200000}){=}200000\ \log(10) \approx 460517.018$
$\log(10^{2000000}){=}2000000\ \log(10) \approx 4605170.18$
$\log(10^{20000000}){=}20000000\ \log(10) \approx 46051701.8$
$\log(10^{200000000}){=}200000000\ \log(10) \approx 460517018$

(Expected to be larger than $\log(10^{200000})$)

As x in $\log(x)$ grows to the limit, the denominator of the equation also grows extremely large. Even if prime numbers are generated, the frequency of occurrence is extremely low. The generation of twin prime numbers is approximately the square of the generation frequency of prime numbers, and the generation frequency is extremely low.

However, as long as prime numbers are generated, twin prime numbers are generated with a very low frequency.

When the number grows to the limit, the denominator of the expression becomes very large, and primes occur very rarely, but since twins are the square of the distribution of primes, the frequency of occurrence of twins is very equal to 0.

However, it is not 0. Therefore, twin prime numbers continue to be generated.

However, when the number grows to the limit, the probability of the twin prime appearing is almost 0 because it is the square of the probability of the appearance of the prime.
It is a subtle place to say that almost 0 appears.

That is, twin primes exist forever.

Proof end.

Appendix

The right end below is the median of (6n -1) (6n+1), that is, Twin Primes.
Thus, the median value of Twin Primes is 6 multiplied by a prime number appeared.

For example, 2, 3, 5, 7, 17, 23, 103, 107, 137, 283, 313, 347, 373, 397, 443, 467, 577, 593, 653, 773, 787, 907, 1033, 1117, 1423, 1433, 1613, 1823, 2027, 2063, 2137, 2153, 2203, 2287, 2293, 2333, 2347, 2677 etc.
Prime numbers are forever. Therefore, Twin Primes are forever.

$12=6\times 2$
$18=6\times 3$
$30=6\times 5$
$42=6\times 7$
$60=6\times 10 = 6 \times 5 \times 2$
$72=6\times 12 = 6 \times 3 \times 2^2$
$102=6\times 17$
$108=6\times 18 = 6 \times 3^2 \times 2$
$138=6\times 23$
$150=6\times 5 \times 5$
$180=6\times 5 \times 3 \times 2$
$192=6\times 2^5$
$228=6\times 19 \times 2$
$240=6\times 5 \times 2^3$
$270=6\times 5 \times 3^2$
$312=6\times 13 \times 2^2$
$348=6\times 29 \times 2$
$420=6\times 7 \times 5 \times 2$
$462=6\times 11 \times 7$
$522=6\times 29 \times 2$
$570=6\times 19 \times 5$
$600=6\times 5^2 \times 2^2$
$618=6\times 103$
$642=6\times 107$
$660=6\times 11 \times 5 \times 2$
$810=6\times 5 \times 3^3$
$822=6\times 137$
$828=6\times 23 \times 3 \times 2$
$858=6\times 13 \times 11$
$882=6\times 7^2 \times 3$
$1020=6\times 17 \times 5 \times 2$
$1032=6\times 43 \times 2^2$
$1050=6\times 7 \times 5^2$
$1062=6\times 59 \times 3$
$1092=6\times 13 \times 7 \times 2$
$1152=6\times 2^6 \times 3$
$1230=6\times 5 \times 41$
$1278=6\times 3 \times 71$
$1290=6\times 5 \times 43$
$1302=6\times 7 \times 31$
$1320=6\times 2^2 \times 5 \times 11$
$1428=6\times 2 \times 7 \times 17$

$1452=6\times 2 \times 11^2$
$1482=6\times 13 \times 19$
$1488=6\times 2^3 \times 31$
$1608=6\times 2^2 \times 67$
$1620=6\times 2 \times 3^3 \times 5$
$1668=6\times 2 \times 139$
$1698=6\times 283$
$1722=6\times 7 \times 41$
$1788=6\times 2 \times 149$
$1872=6\times 2^3 \times 3 \times 13$
$1878=6\times 313$
$1932=6\times 2 \times 3 \times 6 \times 23$
$1950=6\times 5^2 \times 13$
$1998=6\times 3^2 \times 37$
$2028=6\times 2 \times 13^2$
$2082=6\times 347$
$2088=6\times 2^2 \times 3 \times 29$
$2112=6\times 2^5 \times 11$
$2130=6\times 5 \times 71$
$2142=6\times 3 \times 7 \times 17$
$2238=6\times 373$
$2268=6\times 2 \times 3^3 \times 7$
$2310=6\times 5 \times 7 \times 11$
$2340=6\times 2 \times 3 \times 5 \times 13$
$2382=6\times 397$
$2550=6\times 5^2 \times 17$
$2592=6\times 2^4 \times 3^3$
$2658=6\times 443$
$2688=6\times 2^6 \times 7$
$2712=6\times 2^2 \times 113$
$2730=6\times 5 \times 7 \times 13$
$2790=6\times 3 \times 5 \times 31$
$2802=6\times 467$
$2970=6\times 3^2 \times 5 \times 11$
$3120=6\times 2^3 \times 5 \times 13$
$3168=6\times 2^4 \times 3 \times 11$
$3252=6\times 2 \times 271$
$3258=6\times 3 \times 181$
$3300=6\times 2 \times 5^2 \times 11$
$3330=6\times 3 \times 5 \times 37$
$3360=6\times 2^4 \times 5 \times 7$
$3372=6\times 2 \times 281$
$3390=6\times 5 \times 131$
$3462=6\times 577$
$3468=6\times 2 \times 17^2$
$3528=6\times 2^2 \times 3 \times 7^2$
$3540=6\times 2 \times 5 \times 59$

$3558 = 6 \times 593$
$3582 = 6 \times 3 \times 199$
$3672 = 6 \times 2^2 \times 3^3 \times 17$
$3768 = 6 \times 2^2 \times 157$
$3822 = 6 \times 7^2 \times 13$
$3852 = 6 \times 2 \times 3 \times 107$
$3918 = 6 \times 653$
$3930 = 6 \times 5 \times 131$
$4002 = 6 \times 23 \times 29$
$4020 = 6 \times 2 \times 5 \times 67$
$4050 = 6 \times 3^3 \times 5^2$
$4092 = 6 \times 2 \times 11 \times 13$
$4128 = 6 \times 2^4 \times 43$
$4158 = 6 \times 3^2 \times 7 \times 11$
$4218 = 6 \times 19 \times 37$
$4230 = 6 \times 3 \times 5 \times 47$
$4242 = 6 \times 7 \times 101$
$4260 = 6 \times 2 \times 5 \times 71$
$4272 = 6 \times 2^3 \times 89$
$4338 = 6 \times 3 \times 241$
$4422 = 6 \times 11 \times 67$
$4482 = 6 \times 3^2 \times 83$
$4518 = 6 \times 6 \times 251$
$4548 = 6 \times 2 \times 379$
$4638 = 6 \times 773$
$4650 = 6 \times 5^2 \times 31$
$4722 = 6 \times 787$
$4788 = 6 \times 2 \times 2 \times 7 \times 19$
$4800 = 6 \times 2^5 \times 5^2$
$4932 = 6 \times 2 \times 3 \times 137$
$4968 = 6 \times 2^2 \times 3^2 \times 23$
$5010 = 6 \times 5 \times 167$
$5022 = 6 \times 3^3 \times 31$
$5100 = 6 \times 2 \times 5^2 \times 17$
$5232 = 6 \times 2^3 \times 109$
$5280 = 6 \times 2^4 \times 5 \times 11$
$5418 = 6 \times 3 \times 7 \times 43$
$5442 = 6 \times 907$
$5478 = 6 \times 11 \times 83$
$5502 = 6 \times 7 \times 131$
$5520 = 6 \times 2^3 \times 5 \times 23$
$5640 = 6 \times 2^2 \times 5 \times 47$
$5652 = 6 \times 2 \times 3 \times 157$
$5658 = 6 \times 23 \times 41$
$5742 = 6 \times 3 \times 11 \times 29$
$5850 = 6 \times 3 \times 5^2 \times 13$
$5868 = 6 \times 2 \times 3 \times 163$

$5880 = 6 \times 2^2 \times 5 \times 7^2$
$6090 = 6 \times 5 \times 7 \times 29$
$6132 = 6 \times 2 \times 7 \times 73$
$6198 = 6 \times 1033$
$6270 = 6 \times 5 \times 11 \times 19$
$6300 = 6 \times 2 \times 3 \times 5 \times 7$
$6360 = 6 \times 2^2 \times 5 \times 23$
$6450 = 6 \times 5^2 \times 436552 = 6 \times 2^2 \times 3 \times 7 \times 13$
$6570 = 6 \times 3 \times 5 \times 73$
$6660 = 6 \times 2 \times 3 \times 5 \times 37$
$6690 = 6 \times 5 \times 223$
$6702 = 6 \times 1117$
$6762 = 6 \times 7^2 \times 23$
$6780 = 6 \times 2 \times 5 \times 113$
$6792 = 6 \times 2^2 \times 283$
$6828 = 6 \times 2 \times 569$
$6870 = 6 \times 5 \times 229$
$6948 = 6 \times 2 \times 3 \times 193$
$6960 = 6 \times 2^3 \times 5 \times 29$
$7128 = 6 \times 2^2 \times 3^3 \times 117212 = 6 \times 2 \times 601$
$7308 = 6 \times 2 \times 3 \times 7 \times 29$
$7332 = 6 \times 2 \times 13 \times 47$
$7350 = 6 \times 5^2 \times 7^2$
$7458 = 6 \times 11 \times 13$
$7488 = 6 \times 2^5 \times 3 \times 13$
$7548 = 6 \times 2 \times 17 \times 37$
$7560 = 6 \times 2^2 \times 3^2 \times 5 \times 7$
$7590 = 6 \times 5 \times 11 \times 23$
$7758 = 6 \times 3 \times 431$
$7878 = 6 \times 13 \times 101$
$7950 = 6 \times 5^2 \times 53$
$8010 = 6 \times 3 \times 5 \times 89$
$8088 = 6 \times 2^2 \times 337$
$8220 = 6 \times 2 \times 5 \times 137$
$8232 = 6 \times 2^2 \times 7^3$
$8292 = 6 \times 2 \times 691$
$8388 = 6 \times 2 \times 3 \times 233$
$8430 = 6 \times 5 \times 281$
$8538 = 6 \times 1423$
$8598 = 6 \times 1433$
$8628 = 6 \times 2 \times 719$
$8820 = 6 \times 2 \times 3 \times 5 \times 7^2$
$8838 = 6 \times 3 \times 491$
$8862 = 6 \times 7 \times 211$
$8970 = 6 \times 5 \times 13 \times 23$
$9000 = 6 \times 2^2 \times 3 \times 5^3 9012 = 6 \times 2 \times 751$
$9042 = 6 \times 11 \times 137$

$9240 = 6 \times 2^2 \times 5 \times 7 \times 11$
$9282 = 6 \times 7 \times 13 \times 17$
$9342 = 6 \times 3^2 \times 173$
$9420 = 6 \times 2 \times 5 \times 157$
$9432 = 6 \times 2^2 \times 3 \times 131$
$9438 = 6 \times 11^2 \times 13$
$9462 = 6 \times 19 \times 83$
$9630 = 6 \times 3 \times 5 \times 107$
$9678 = 6 \times 1613$
$9720 = 6 \times 2^2 \times 3^4 \times 5$
$9768 = 6 \times 2^2 \times 11 \times 37$
$9858 = 6 \times 31 \times 53$
$9930 = 6 \times 5 \times 331$
$10008 = 6 \times 2^2 \times 3 \times 139$
$10038 = 6 \times 7 \times 239$
$10068 = 6 \times 2 \times 839$
$10092 = 6 \times 2 \times 29^2$
$10140 = 6 \times 2 \times 5 \times 13^2$
$10272 = 6 \times 2^4 \times 107$
$10302 = 6 \times 17 \times 101$
$10332 = 6 \times 2 \times 3 \times 7 \times 41$
$10428 = 6 \times 2 \times 11 \times 79$
$10458 = 6 \times 3 \times 7 \times 83$
$10500 = 6 \times 2 \times 5^3 \times 7$
$10530 = 6 \times 3^3 \times 5 \times 13$
$10710 = 6 \times 3 \times 5 \times 7 \times 17$
$10860 = 6 \times 2 \times 5 \times 181$
$10890 = 6 \times 3 \times 5 \times 11^2$
$10938 = 6 \times 1823$
$11058 = 6 \times 19 \times 97$
$11070 = 6 \times 3^2 \times 5 \times 41$
$11118 = 6 \times 17 \times 109$
$11160 = 6 \times 2^2 \times 3 \times 5 \times 31$
$11172 = 6 \times 2 \times 7^2 \times 19$
$11352 = 6 \times 2^2 \times 11 \times 43$
$11490 = 6 \times 5 \times 383$
$11550 = 6 \times 5^2 \times 7 \times 11$
$11700 = 6 \times 2 \times 3 \times 5^2 \times 13$
$11718 = 6 \times 3^2 \times 7 \times 31$
$11778 = 6 \times 13 \times 151$
$11832 = 6 \times 2^2 \times 17 \times 29$
$11940 = 6 \times 2 \times 5 \times 199$
$11970 = 6 \times 3 \times 5 \times 7 \times 19$
$12042 = 6 \times 3^2 \times 223$
$12072 = 6 \times 2^2 \times 503$
$12108 = 6 \times 2 \times 1009$
$12162 = 6 \times 2027$

$12240{=}6{\times}2^3 \times 3 \times 5 \times 17$
$12252{=}6{\times}2 \times 1021$
$12378{=}6{\times}2063$
$12540{=}6{\times}2 \times 5 \times 11 \times 19$
$12612{=}6{\times}2 \times 1051$
$12822{=}6{\times}2137$
$12918{=}6{\times}2153$
$13002{=}6{\times}11 \times 197$
$13008{=}6{\times}2^3 \times 271$
$13218{=}6{\times}2203$
$13338{=}6{\times}3^2 \times 13 \times 19$
$13398{=}6{\times}7 \times 11 \times 29$
$13680{=}6{\times}2^3 \times 3 \times 5 \times 19$
$13692{=}6{\times}2 \times 7 \times 163$
$13710{=}6{\times}5 \times 457$
$13722{=}6{\times}2287$
$13758{=}6{\times}2293$
$13830{=}6{\times}5 \times 461$
$13878{=}6{\times}3^2 \times 257$
$13902{=}6{\times}7 \times 331$
$13932{=}6{\times}2 \times 3^3 \times 43$
$13998{=}6{\times}2333$
$14010{=}6{\times}5 \times 467$
$14082{=}6{\times}2347$
$14250{=}6{\times}5^3 \times 19$
$14322{=}6{\times}7 \times 11 \times 31$
$14388{=}6{\times}2 \times 11 \times 109$
$14448{=}6{\times}2^3 \times 7 \times 43$
$14550{=}6{\times}5^2 \times 97$
$14562{=}6{\times}3 \times 809$
$14592{=}6{\times}2^7 \times 19$
$14628{=}6{\times}2 \times 23 \times 53$
$14868{=}6^2 \times 7 \times 59$
$15138{=}6{\times}3 \times 29^2$
$15270{=}6{\times}5 \times 509$
$15288{=}6{\times}2^2 \times 7^2 \times 13$
$15330{=}6{\times}5 \times 7 \times 73$
$15360{=}6{\times}2^9 \times 5$
$15582{=}6{\times}7^2 \times 53$
$15642{=}6{\times}3 \times 11 \times 79$
$15648{=}6{\times}2^4 \times 163$
$15732{=}6^2 \times 19 \times 23$
$15738{=}6{\times}43 \times 61$
$15888{=}6{\times}2^3 \times 331$
$15972{=}6{\times}2 \times 11^3$
$16062{=}6{\times}2677$
$16068{=}6{\times}2 \times 13 \times 103$

$16140 = 6 \times 2 \times 5 \times 269$
$16188 = 6 \times 2 \times 19 \times 71$
$16230 = 6 \times 5 \times 541$
$16362 = 6 \times 3^3 \times 101$
$16452 = 6^2 \times 457$
$16632 = 6^3 \times 7 \times 11$
$16650 = 6 \times 3 \times 5^2 \times 37$
$16692 = 6 \times 2 \times 13 \times 107$
$16830 = 6 \times 3 \times 5 \times 11 \times 17$
$16902 = 6 \times 3^2 \times 313$
$16980 = 6 \times 2 \times 5 \times 283$
....
....
The second proof ends.

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] M.Bortolomasi, A.Ortiz-Tapia.: Some remarks on the first Hardy-Littlewood conjecture, arXiv:1904.03017

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

Postscript

I thank Prof. 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

Professor Saito, I think Toshiro Takami is crazy.
I know Next Infinity is Zero but not Division Zero Culclus.
I am going to bet my life on fishing. I quit math.


Old photo

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.

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.

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.

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 400,000 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 400,000, 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.