Cousin Primes Conjecture

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Abstract

Cousin Primes Conjecture were performed using WolframAlpha and Wolfram cloud from the beginning this time, as in the case of the twin primes that we did the other day.

Cousin Primes and Twin Primes have exactly the same dynamics.

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

In the hexagon, Cousin Primes are generated only at (6n+1)(6n+5). [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 Cousin Primes are 4/3 times the square of the distribution of primes, the frequency of occurrence of Cousin Primes is very equal to 0.

However, it is not 0. Therefore, Cousin Primes continue to be generated.

That is, Cousin Primes exist forever.

key words

Hexagonal circulation, Cousin primes, 4/3 times the square of the probability of the Primes

Introduction

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

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

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

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

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

The Cousin Primes are (6n+1) and (6n -1).
The following is a Cousin Primes.
There are no prime numbers that are not (6n -1) or (6n+1).
7 ——— 6n+1 (Cousin primes)
11 ——— 6n -1
13 ——— 6n+1 (Cousin primes
17 ——— 6n -1
19 ——— 6n+1 (Cousin primes
23 ——— 6n -1
....
....

I wrote below the distribution of Cousin Primes.

There are 9592 Primes to 1×10^5=100000.
Probability is $\frac{9592}{100000}$.
In this, there are 1216 Cousin Primes. Probability is $\frac{1216}{100000}$=0.01216
and $[\frac{9592}{100000}]^2 \times \frac{4}{3}$=0.01226752853...

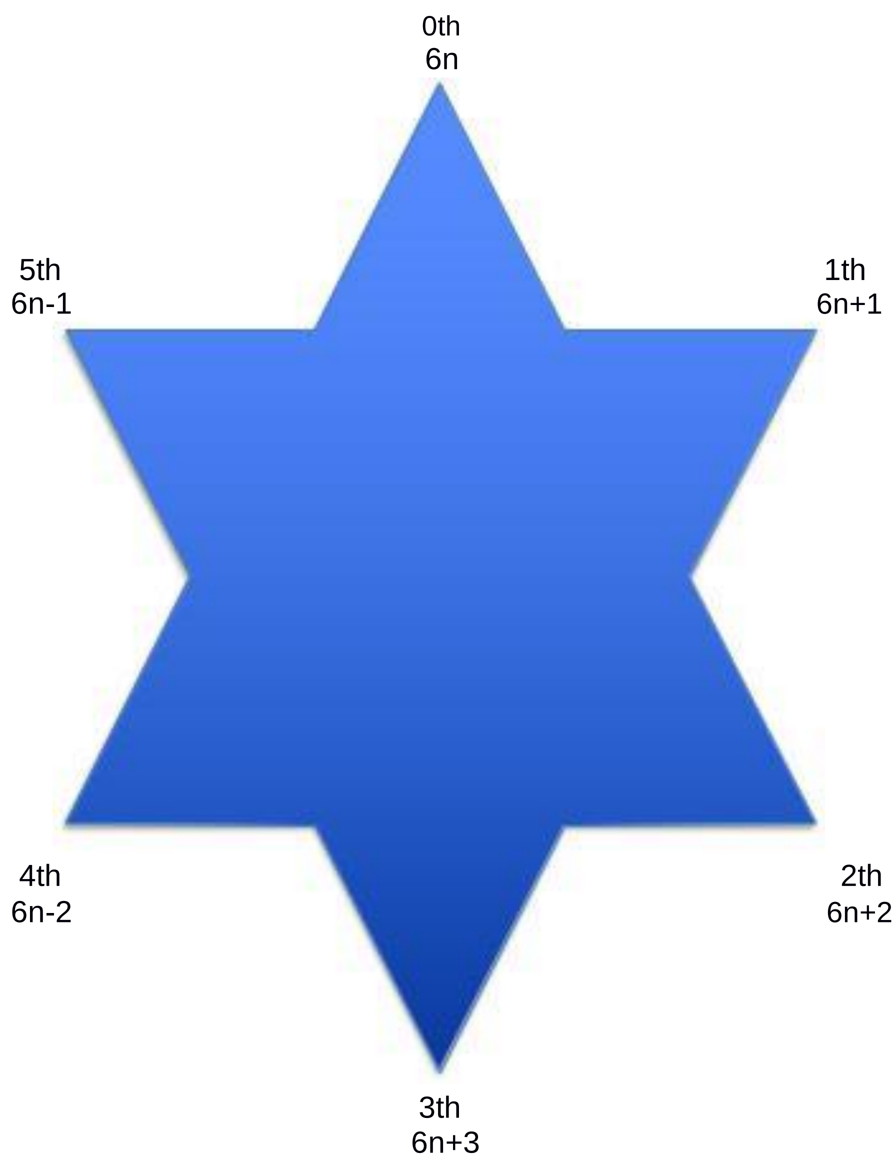
and
There are 78498 Primes to 1×10^6=1000000.
Probability is $\frac{78498}{1000000}$.
In this, there are 8144 Cousin Primes. Probability is $\frac{8144}{1000000}$=0.008144...
and $[\frac{78498}{1000000}]^2 \times \frac{4}{3}$=0.008215914672

and
There are 664579 Primes to 1×10^7=10000000.
Probability is $\frac{664579}{10000000}$.
In this, there are 58622 Cousin Primes. Probability is $\frac{58622}{10000000}$=0.0058622
and
$[\frac{664579}{10000000}]^2 \times \frac{4}{3}$=0.0058888699632133...

There are 5761455 Primes to $1 \times 10^8 = 100000000$.
Probability is $\frac{5761455}{10000000}$.
In this, there are 440258 Cousin Primes. Probability is $\frac{440258}{10000000}$=0.00440258

and $[\frac{5761455}{10000000}]^2 \times \frac{4}{3}$=0.004425909052127...

As in the case of Twin Primes, constant = 4/3 even in Cousin Primes.


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

Discussion

Although not found in the literature, cousin primes and twin primes have exactly the same dynamics.
This means that if twin primes are infinite, cousin primes are infinite.

The probability that Cousin Primes will occur 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 Primes is generated, Cousin Primes be generated.

And, as can be seen from the equation below, even if the number becomes large, the degree of occurrence of Primes 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 primes are generated, the frequency of occurrence is extremely low. The generation of Cousin Primes is approximately the square of the generation frequency of primes, and the generation frequency is extremely low.

However, as long as Primes are generated, Cousin Primes 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 Cousin Primes are 4/3 times the square of the distribution of Primes, the frequency of occurrence of Cousin Primes is very equal to 0.

However, it is not 0. Therefore, Cousin Primes continue to be generated.

However, when the number grows to the limit, the probability of the Cousin Primes appearing is almost 0 because it is 4/3 times the square of the probability of the appearance of the Prime. It is a subtle place to say that almost 0 appears.

Use a contradiction method.
If Cousin Primes is finite, the Primes is finite.
This is contradictory. Because there are an infinite of Primes.

That is, Cousin Primes exist forever.

Proof end.

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