Proof for Twin Prime Conjecture

Mesut Kavak[a]

The question about Twin Primes is pretty clear:

"Twin primes are prime numbers that differ by 2. Are there infinitely many twin primes?"

[a]kavakmesut@outlook.com.tr

I. Introduction

If any number group containing "n" consecutive and odd non-prime numbers is selected among the infinite number groups, this group must be between 2 prime numbers according to this condition. For n=4, choose a group of numbers as follows, consisting of 4 consecutive odd numbers, n_1, n_2, n_3 and n_4, which are between 2 prime numbers such as p_1 and p_2.

$$\mathbf{p_1} \quad n_1 \quad n_2 \quad n_3 \quad n_4 \quad \mathbf{p_2}$$

II. Solution

Theorem *At least one of these non-prime consecutive odd numbers of "n" must be an odd multiple of 3; because the distribution of odd multiples of 3 in the set of odd numbers depends on the function f(x)=6x+3, and therefore in the set of odd numbers there are always 2 consecutive odd numbers between every two consecutive odd multiples of 3.*

$$n_0 \quad n_x \quad \mathbf{p_1} \quad n_1 \quad n_2 \quad n_3 \quad n_4 \quad \mathbf{p_2} \quad n_y \quad n_5$$

- If the odd number n_2 is considered an odd multiple of 3, the prime number p_2 must be the next consecutive odd multiple of 3.

  Since p_2 is a prime number, this is only possible if it falls on a non-prime number in a group such as n=5.

  For n=4, different groups must be formed.

- If the odd number n_3 is considered an odd multiple of 3, then the prime number p_1 must be the previous consecutive odd multiple of 3.

  Since p_1 is a prime number, this is only possible if it falls on a non-prime number in a group such as n=5.

  For n=4, different groups must be formed.

- If the odd number n_1 is considered an odd multiple of 3, the odd number n_4 must be the next consecutive odd multiple of 3.

  Also, the odd number n_5 must be the second consecutive odd multiple of 3 immediately after the odd number n_4, and the odd number n_0 must be the previous odd multiple of 3 before the odd number n_1.

- If the odd number n_4 is considered an odd multiple of 3, the odd number n_5 must be the next consecutive odd multiple of 3.

  Also, for this acceptance, the odd numbers n_0 and n_1 must be previous consecutive odd multiples of 3; so *"The odd numbers* n_1 *and* n_4 *are the best choice to be odd multiples of 3."*

III. Result

The odd number n_5 can be followed by an infinite number of consecutive odd numbers "n"; therefore, for any value of "n" after the group $n = 4$, the number of elements of an odd set of numbers "n" is unimportant; but the odd number n_y is always prime or not, which is important. With this information, the $n_y = n_5 - 2 = (6x + 3) - 2$ equation forms the (1) equation.

$$n_y = 6x + 1 \tag{1}$$

So it can be said for n_y;

I. n_y out of (1) with the condition $x \in \mathbb{Z}^+ \wedge x > 0$ can never be just a prime or a non-prime number.

II. It is not prime over (1) for an "x" value that does this; but it is prime for odd numbers formed between two numbers n_y and n_{y+1} which are the result of two consecutive numbers x and $x + 1$.

III. After all, when $n_y = p_3$ it is a group of twin primes between odd numbers n_4 and n_5; therefore twin primes are "infinite" even for the groups which have the same number of elements and different numbers that these groups can be written even for only a single value "n".

Result *"Twin primes are prime numbers that differ by 2, and there are an infinite number of twin primes."*

12.06.2023