PERSPECTIVE

The symmetry of N-domain and prime conjectures

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ABSTRACT

In this paper, we discuss the symmetry of N-domain and we find that using the symmetry characters of Natural Numbers we can give proofs of the Prime Conjectures: a concise proof of Fermat last theorem、 Polignac's conjecture (twins Prime Conjecture) Goldbach Conjecture and Reimann Hypothesis.

Key Words: *N domain; Prime conjectures*

INTRODUCTION

We have

N ~(0,1,2,3,4, ………) *all the natural numbers*

n ~(1,2,3,4, ………) *all the natural numbers excepted* 0

P ~(2,3,5,7, ………) *all the prime numbers*

p ~(3,5,7, ………) *all the odd prime numbers*

We notice that

N ~(0, n)

P ~(2, p)

1: The proof of twin primes conjecture and goldbach conjecture

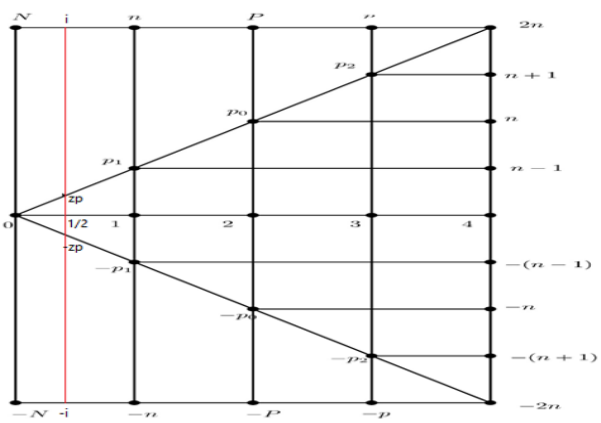

Figure 1) *The Symmetry of N-domain*

We can define a N, n, P, p, 2n coordinate system shown in Figures 1 and 2.

N axis: -N 0 N

i axis: -i -zp 1/2 zp i

n axis: -n -p1 1 p1 n

P axis: -P -p0 2 p0 P

p axis: -p -p2 3 p2 p

2n axis: -2n -（n+1）-n -(n-1) 4 n-1 n n+1 2n

$p1,\ p0,\ p2 \in p$

we can get

$p1 \to n-1$

$p0 \to n$

$p2 \to n+1$

And

$-p1 \to -(n-1)$

$-p0 \to -n$

$-p2 \to -(n+1)$

So we have

$p2 + (-p1) \to n+1-(-(n-1)) = 2n$

This is the proof of Polignac's conjecture.

And

$p2 - p1 \to (n+1)-(n-1) = 2$

This is the proof of twin primes conjecture.

And

$2n = n+1+n-1 \to p2 + p1$

And

$n-1 > 2 \quad n > 3 \quad$ so $\ 2n > 6$

This mean that every even number bigger than six can be divided into two odd prime numbers in N domain.

This is the proof of Goldbach conjecture.

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2: The proof of Riemann Hypothesis

Riemann Zeta-Function is

$$\xi(s) = \sum_{n=1} \frac{1}{n^s} = \prod \frac{1}{1-p^s} \qquad (s = a + bi)$$

Riemann hypothesis

All the Non-trivial zero-point of Zeta-Function $Re(s) = \frac{1}{2}$.

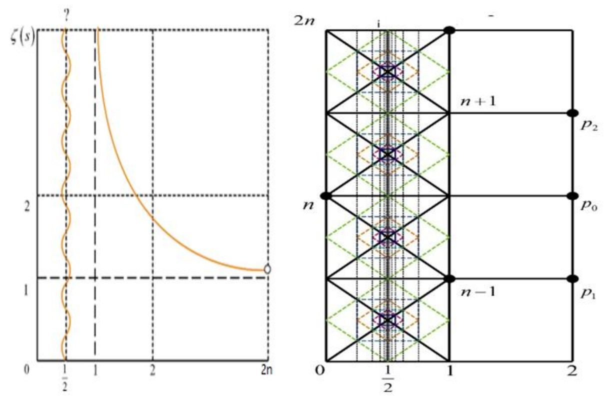

Figure 2) *All the non-trivial Zero points of Riemann zeta-function are on the 1/2 axis*

We have

$0 = 1/2 - 1/2$

$1 = 1/2 + 1/2$

$i2 = -1$

$1/2 = 1/2 * (1/2+1/2i)(1/2-1/2i)$

$$1 + \begin{bmatrix} 1 & i & 0 \\ 0 & \frac{1}{2} & 1 \\ 1 & -i & 0 \end{bmatrix} \begin{bmatrix} \frac{1}{2} & 1-i \cdots\cdots & \frac{1}{n}-ni \\ 1+i & \frac{1}{2} & \cdots\cdots\cdots \\ \cdots\cdots\cdots & \frac{1}{2} & \cdots\cdots\cdots \\ \frac{1}{n}+ni & \cdots\cdots\cdots & \frac{1}{2} \end{bmatrix}$$

The tr(A)=1/2*n

This is mean that all the non-trivial Zero points of Riemann zeta-function are on the 1/2 axis just show as Fig.3. This is the proof of Hilbert–Pólya conjecture. So we give a proof of Riemann Hypothesis (Figures 2 and 3).

3: A concise proof of fermat' last theorem

We can definite a function as

$$\frac{p}{2n} = \begin{cases} 1/2, & n \in p \\ 0, & n \neq\in p \end{cases}$$

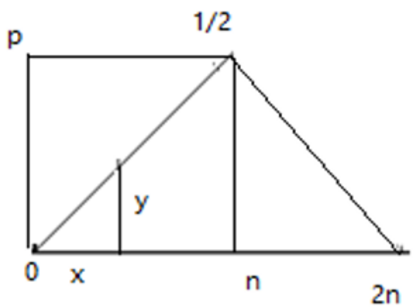

Figure 3) *The p/2n function*

So $x + y = n$

Equal to: $\frac{x+y}{2n} = 1/2$

And $x + y \in p$

$x^2 + y^2 = n^2$

Equal to: $\left(\frac{x+y}{2n}\right)^2 - \left(\frac{\sqrt{2xy}}{2n}\right)^2 = 1/4$

$x + y \in p$ and $\sqrt{2xy} \neq\in p$

But we notice that:

When $x + y = 3 \in p$ $xy = 3$ $(x = 1, y + 3)$

$\sqrt[3]{3(x+y)xy} = 3 \in p$

This is equal to $X^3 + Y^3 = n^3$ has no integer solution. This is a concise proof of Fermat' last Theorem.