Expansion Theorem of Shinichi Mathematics

Shinichi Yoshimi

ORCID: 0009-0008-8121-8947

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1 Meaning of Symbols

In Shinichi Mathematics:

- A number is an entity that emerges from the relation $\sqrt{1} = 0$.
- N stands for **Notation**, and it is a placeholder capable of accepting all values.
- a, k, n, X, Y, Z are symbols that can represent numerical values.
- φ (phi) is a ratio derived from the balance among three elements $X : Y : Z$ appearing in the division of 1, based on the structure $\sqrt{1} = 0$.
- E_N refers to **Emergence**, indicating the rate of structural emergence.
- The symbol $\overset{\text{hobo}}{=}$ acts as a conceptual bridge between Shinichi Mathematics and conventional mathematics.

  It is named **hobo** by Shinichi Yoshimi, derived from:

  - Greek: *homo* (meaning "same")
  - Japanese: *hobo* (meaning "almost")

  It expresses structural similarity without requiring strict equality.

2 Infinite Ratio Transformation Law

$$1 \overset{\text{hobo}}{=} 10^N$$

Explanation:
This represents the idea that the number 1 can be infinitely divided.

For example, although 1:100 differs in quantity, geometrically they are similar. Thus, 1 can be subdivided in the same structural manner as 100.

This equation is not directly used in Shinichi Mathematics itself, but becomes necessary when converting it into the language of conventional mathematics.

3 Root-N Conversion Method

When 1 is divided into three components X, Y, Z, the internal ratio $X : Y : Z$ arises as the fundamental unit of structure.

Assume that Z is the largest among the three:

$$X < Z, \quad Y < Z$$

Three scenarios define φ:

- If $X + Y > Z$: $\quad \varphi = \dfrac{X+Y}{Z}$
- If $Z > X + Y$: $\quad \varphi = \dfrac{Z}{X+Y}$
- If $X + Y = Z$: $\quad \varphi = 1$

Then we define:

$$E_N = \sqrt{(2\varphi - 1)^N}$$

This represents an extended emergence rate based on $\sqrt{N}$ behavior. The value of $\sqrt{N}$ varies depending on how many parts 1 is divided into.

Example: For $\sqrt{4}$, if divided into 2 parts $\rightarrow$ ratio is $1 : 2.5$ If into 3 parts $\rightarrow$ $2 : 6 : 2$

4 Root-N Dynamic Method

Given the constraint:

$$X_1 + X_2 = 1$$

Then the expansion:

$$(X_1 + X_2)^N = \sum_{k=0}^{N} \binom{N}{k} X_1^{N-k} X_2^k$$

This reflects a dynamic binomial distribution under conservation.

5 Squared Total Ratio Transformation Law

Let:

$$n \in \mathbb{Z}_{>0} \quad \text{(positive integer)}$$

Condition:

$$\sum_{i=1}^{n} X_i = 1$$

Then:

$$\left(\sum_{i=1}^{n} X_i\right)^2 = \sum_{i=1}^{n} X_i^2 + 2 \sum_{1 \le i < j \le n} X_i X_j$$

This breaks the square of a whole into self-components and cross-interactions.

6 Total Number of Constructed Elements

$$T(n) = \frac{n(n+1)}{2}$$

This function counts the total number of structural components up to n.

7 Shinichi Theorem

Condition:

$$\sum_{i=1}^{k} X_i = 1$$

Claim:

$$\left(\sum_{i=1}^{k} X_i \right)^N = 1$$

Expansion Structure:

$$1 = \sum_{\substack{a_1+a_2+\cdots+a_k=N \\ a_i \geq 0}} \left[\frac{N!}{a_1! a_2! \cdots a_k!} X_1^{a_1} X_2^{a_2} \cdots X_k^{a_k} \right]$$

This multinomial expansion shows how the unity (1) emerges structurally from combinations of constituent variables raised to powers summing to N.

8 Conclusion

Thus, the entity known as "1" in Shinichi Mathematics is capable of structurally representing all expressions. It is the foundational form through which emergence, division, and totality are defined.

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