# Special Numbers Among Natural Numbers And The Riemann Hypothesis

**Abstract**
This article attempts to prove that there are special numbers among natural numbers and this article attempts to prove that the Riemann Hypothesis and the Riemann Hypothesis may have flaws and errors.
**Keywords:** Prime Number; Riemann Hypothesis; Natural Numbers; Special Numbers
The positive infinity of prime numbers is a core conclusion that has been proven in number theory: there is no largest prime number, and prime numbers are infinite. This premise leads to an intuitive inference: among the infinite number of prime numbers, the number of each digit (ones, tens, hundreds, etc.) must have infinite changes between 0 and 9. It can be further inferred from this: the number of occurrences of the 10 numbers 0-9 in each digit of the prime number should be positive infinity.
Based on this logic, we can construct the following mathematical expression:
Let $P(\infty)$ represent the total number of prime numbers (positive infinity), and $(N_d(\infty) d \in \{0,1,2,\ldots,9\})$ represent the number of occurrences of the number $d$ in all digits of the prime number (all positive infinity). According to conjecture, the positive infinite number of occurrences of each number is equivalent to the positive infinite number of prime numbers:

$$\sum_{d=0}^{9} N_d(\infty) = P(\infty)$$

Further derivation, if the number of positive infinity of each number is defined as $\sum_{d=0}^{9} N_d(\infty)$(essentially the addition of 10 positive infinity, it is still positive infinity), then there is:

$$\sum_{d=0}^{9} N_d(\infty) - P(\infty) = 1^{\infty}$$

Since the difference between positive infinity is given special meaning under this conjecture framework, and $1^{\infty}$=1 (here is the operation result), we finally get:

$$\sum_{d=0}^{9} N_d(\infty) - P(\infty) = 1$$

This result directly points to the core premise of the Riemann Hypothesis - the essence of the Riemann Hypothesis is a conjecture about the density of the distribution of prime numbers, and its establishment depends on the "regularity" of the distribution of prime numbers. The above derivation shows that the digital distribution of prime numbers implies a special infinite operation relationship, and the calculation result is 1. This conflicts with the distribution law preset by the Riemann Hypothesis. From this, it can be speculated that the Riemann Hypothesis may have errors.

More importantly, this contradiction implies that there may be a special number in the natural number system: the mathematical derivation in this article may break through the concept of non-prime numbers or composite numbers, and find special numbers that are neither prime numbers nor composite numbers. The mathematical derivation in this article may also break the mutual exclusivity of prime numbers and composite numbers, and find special numbers that are both prime numbers and composite numbers. The existence of this special number may reconstruct the classification rules of natural numbers and provide a new perspective for the study of prime number distribution.

**References**

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