On the infinitesimals

Ihsan Raja Muda Nasution

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Abstract

Our result is the explicit form of the infinitesimals.

1 Introduction

Tropp [Tro02] believed that non-standard analysis provides the most satisfying view of infinitesimals. Parker [Par] stated that analysis can be based on both a constructivist and intuitive view of the infinitesimal. In this paper, we provide the construction of the minimum near zero.

2 Construction of the small number

For any non-negative integer $n$, it holds

\[ 10^n = 1\underbrace{0\ldots0}_n \]

and

\[ 10^{-n} = 0.\underbrace{0\ldots01}_{n-1} \]

For the infinity $W$, we define

\[ 10^W = : 100\ldots \]

By deleting the zero, we obtain

\[ 000\ldots \to 000\ldots \to 000\ldots \to \ldots 00. \]

For the infinity $W$,

\[ 10^{-W} = 0.\ldots001. \]

We use the notation $|$ to separate between the decimal point and ad infinitum notation $\ldots$. We denote the number $0.\ldots001$ by $\Psi$.

References
