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EXPLORING INFINITY MATHEMATICALLY

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Abstract: Infinity has been explored by developing a newer approach to arrive at mathematically logical and paradox-free conclusions.

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1. Introduction

Infinite/Infinity has been a topic of discussion since ancient times. There has been discussion on physical as well as abstract infinities by considering them in largest and smallest possible forms but it has often ended in quagmires / paradoxes due to one or the other reason [1, 2, 3].

In the present investigation, abstract infinity has been explored. Such an infinity has its genesis in the abstraction of natural numbers by way of dissociating them from the process of counting of finite number of things present in the given collection, and then, associating them with the operation of successive addition of one, which can be continued for ever. Thus $N = \{1, 2, 3, ...\}$ came to be recognized as the first infinite set having infinity as its cardinal number. However, it may be added that this infinity is not a number itself but a characteristic of the infinite set N.

In fact, the cardinal number of every infinite set will be infinity. Thus, with a view to explore such infinities, it will be necessary to first define the cardinal number of the set N. This, in turn, will also facilitate in arriving at mathematically logical and paradox-free conclusions.

2. Cardinality of the set N

For working out a mathematical definition of the cardinal number of the set N, note that the concept of infinity was introduced to keep logically thinking minds