If the infinite summation 1+2+3+4... equals a number, we should ignore infinity.

Ayman Timjicht

January 29, 2024

Abstract

This article contains a proof of the implication between the consideration of the infinite summation $1 + 2 + 3 + 4 + ...$ as a number, and the infinite summation $1 + 1 + 1 + 1 + ... = 0$.

keywords

word	definition
infinite summation	Summing infinite sequence of numbers
number	Quantity expressing a value

1 Introduction

Infinite series is one of the important concepts in mathematics. It tells about the sum of a series of numbers that do not have limits. If the series contains infinite terms, it is called an infinite series, and the sum of the first n terms, Sn, is called a partial sum of the given infinite series. If the partial sum, i.e. the sum of the first n terms, Sn, given a limit as n tends to infinity, the limit is called the sum to infinity of the series, and the result is called the sum of infinite of series.

2 Infinite Sum implication Proof

we suppose that

$$1 + 2 + 3 + 4 + ... = a \in \mathbb{K}, \mathbb{K} = \mathbb{R} \vee \mathbb{C}$$

So :

$$0 + 1 + 2 + 3 + 4 + ... = 0 + a = a$$

and also:

$$1 + 2 + 3 + 4 + ... = a$$

$$-$$

$$1+0+0+0+...=1$$

equals:

$$0+2+3+4+...=a-1$$

and:

$$0+1+2+3+4+...=a$$

So:

$$0+2+3+4+...=a-1$$

$$-$$

$$0+1+2+3+4+...=a$$

equals:

$$0+1+1+1+...=-1$$

And then :

$$0+1+1+1+...=-1$$

$$+$$

$$1+0+0+0+...=1$$

equals:

$$1+1+1+1+...=0$$

3 Conclusion

In conclusion, the sum $\sum_{n=1}^{\infty} 1$ can be expressed as $\lim_{n\to\infty} \sum_{k=0}^{n} 1 = \lim_{n\to\infty} n+1$, which diverges to ∞. Therefore, the initial assumption is mathematically false.

References

infint Series: https://en.wikipedia.org/wiki/Series_(mathematics)
infinite series formula: https://byjus.com/infinite-series-formula/