

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

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Abstract

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

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, S_n , is called a partial sum of the given infinite series. If the partial sum, i.e. the sum of the first n terms, S_n , 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

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

So :

$$0 + 1 + 2 + 3 + 4 + \ldots = 0 + a = a$$

and also:

$$1 + 2 + 3 + 4 + \ldots = a$$

$$- \\ 1 + 0 + 0 + 0 + \dots = 1$$

equals:

$$0 + 2 + 3 + 4 + \dots = a - 1$$

and:

$$0 + 1 + 2 + 3 + 4 + \dots = a$$

So:

$$0 + 2 + 3 + 4 + \dots = a - 1$$

$$- \\ 0 + 1 + 2 + 3 + 4 + \dots = a$$

equals:

$$0 + 1 + 1 + 1 + \dots = -1$$

And then :

$$0 + 1 + 1 + 1 + \dots = -1$$

$$+ \\ 1 + 0 + 0 + 0 + \dots = 1$$

equals:

$$1 + 1 + 1 + 1 + \dots = 0$$

3 Conclusion

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

References

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