Finite Space Construction

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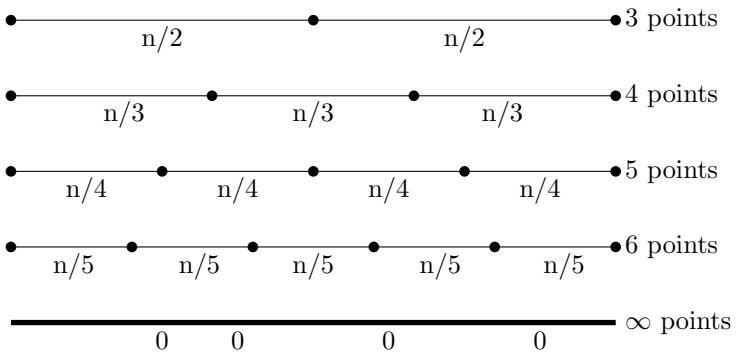
1 Introduction

The former teachings of mathematical spaces taught us that spaces can be both finite and infinite. For example, we are told that the real number line extends infinitely while constituting an infinite space. This paper says that when a space is constructed by the smallest entity, a point, which is finite, then finite spaces of all dimensions are well-defined, whereas infinite spaces are undefined. Hence, this paper is going to show you how an infinite number of points constitutes a finite space and that infinite spaces are undefined.

2 Proof



As seen in the illustration above, when there is x number of points that are equally distributed on the line, there is $x-1$ number of divisions and the length of each division is $n/(x-1)$. We are trying to fully close the gaps between all consecutive points to construct a finite continuous space; therefore, we use the limit:

$$\lim_{x\to\infty} n/(x-1) = 0$$

The above statement is a function that models the behavior in the illustration and tells us that as the number of points equally distributed on the line reaches

infinity, $(x-1)$ approaches infinity, thus making the gaps between all consecutive points infinitely approach zero in length - which is zero, which means that as the number of points reaches infinity between any two points, they constitute a continuous finite line. You will see from the formula that if there is a finite number of points, the gaps never become zero in length, which means that a finite number of points cannot constitute a continuous finite line.

3 Results

We can show that, unlike finite spaces, infinite spaces cannot be formally constructed using the proof, that is, if you replace n with ∞ it becomes

$$\lim_{x \to \infty} \infty/(x-1) = \infty/\infty$$

which is an indeterminate form. According to the formula, in order to constitute a space of any kind, whether finite or infinite, gaps have to close. However, the existing indeterminate form says nothing about whether gaps close or not because existing mathematics says that further evaluation is needed to decide the limit but in this case further evaluation is not possible. Therefore, technically speaking, infinite spaces are undefined. Intuitively, this makes sense because the number of points reaches infinity between two ever-expanding boundaries. Can you then tell whether the gaps between all consecutive points close or not? I think it is not possible. Therefore, outer space is most likely finite because infinite spaces are mathematically undefined.

What all these mean is that you have something concrete when you say that spaces are finite. But you have nothing in your hand when you claim that spaces are infinite.