A geometry consisting of singularities containing only integers

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Research Article

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Abstract

It is difficult for us to discriminate the sizes of space and time as finite and infinite. In this article an axiom is defined in which one infinitely small and infinitely great must exist if the sizes of space and time can be compared and it is undividedly 0(zero) point (singularity) for this infinitely small.this axiom have some new characters distinct from current calculus ,such as extension only can be executed in the way of unit superposition in the system, the decimal point is meaningless and there aree only integers to exist in the system, and any given interval is finite quantites and can not be ‘included’ or ‘equal divided’ infinitely and randomly.The geometry space we see are the non-continuum being made of countless 0 points .

□ Introduction

□.1. Infinitesimally small in calculus is defined as infinitely quantities close to zero, and we still don't know if such zero points indeed exists[1][2]. If it exists, what is its relationship to the quantities around it. It is aslo difficult for us to define which parts is infinitesimal and how to differentiate the sizes of space and time as finite and infinite.For example,Compared with infinitely great,one meter long or 300,000 kliometers is usually regarded as the quantities of finite ,However,it can be supposed to be the quantities of infinite due to it is aslo divided infinitely into samaller parts.Thus it can be seen that we are obscure in concept of infinitely small and infinitely great.

□ Preliminaries

Definition □.1. Here an axiom is defined (axiom1) in which one infinitely small and infinitely great must exist if the sizes of space and time can be compared (namely there is small and great in sizes) and it is undividedly 0(zero) point (singularity) for this infinitely small.Now considering this infinitely small.Because of being the smallest quantities,thus the quantity beside this infinitely small ,that is aslo called the next quantity,is the second 0,and so on,is the third 0,the fouth 0,etc.Therefore,all quantities are in the units of 0.In order to describe briefly,‘0’is expressed by‘□’,as shown in Fig. 1.

Definition □.2. Now I define the axiom 2 that is counter-example toward axiom 2. The any given system in axiom 2 can be divided infinitely and randomly.The quantities inside this given system (for example,1 meter long or 300,000 kliometers)contain all quantities outside the given system and random devided value outside the given system can be found wholly within the system.Contrary to axiom 1,there is no infinitely small and infinitely great in the axiom 2. There is no existence of the third axiom. In the event of axiom1 exists, then axiom 2 do not exist.

□ Main Results

Preliminaries □.1. Before some characters of axiom1 are described,some algorithms are adopted to illustrate conveniently the relation among these quantities.The relation between two quantities are described by the term called ‘include’ and ‘equal divided’.

Example □.2. For example,Considering 10 and 2,That how much 10 includes 2 is expressed as 10□□2=5,and that how much 10 is equally divided by 2 is expressed as 10/2=5 . 10□□2=5 is not the same as 10/2=5 because the former can be expressed as 10/5=2 by 'equal divided' and the latter can be expressed as 10□□ 5=2 by 'include'.

Theorem □.3. I find that the extension only can be executed in the way of unit superposition in the system of axiom 1.

Example □.4. Now I consider two random quantities extending(or superposing) on the basis of the same proportion in the system of axiom1.For example,the accurate value for any extension of 2□□1 can not be found due to its next extension 3□□□have not quantities to be selected within the range of the values in the system because the infinitely small is smallest and undivided so that there are not value between 1 and 2. For another instance, ,the accurate value for 4□□3 can aslo not be found due to this value only can be selected in 1 and 2 within the range of the values in the system,so the extension of 4□□3 is meaningless.Therefore Further,that is in a unit of 1□2□3□4……,Corresponding to the 'include' values are 1□□1□ 2□□1□3□□1□4□□1…….For example,the next extension quantities for 2□□1 is 4□□2,again the next is 6□□3,an so on.For another instance, ,the next extension quantities for 5□□1 is 10□□2,again the next is 15□□3,an so on. The 'include'quantities of the extension of the origin must be any units□□1 due to the extension only can be executed in the way of unit quantities. As shown in figure 2.

Theorem □.5. I draw the conclusion that there is no definite values for two random quantities that can not be exactly divided.We let divisor not move(no extension) and allow dividend extend continually to acquire quantities that can exactly divide divisor[3] .It is concluded here that for any two quantities (dividend and divisor)that is not divided exactly we must obtained the aliquot quantites that is integar times of this divisor by the way of extending dividend to infinitely great ,not to infinitesimal.

Example □.6. Seeing figure 3. Now I still consider 4□□3=? in the range of system of axiom1 .No quantities can be choosen for the accurate value (between 1 and 2) calculated due to 1 and 2 can be only selected in the system.To calculate the accurate value for 4□□3,3 is not allowed to extend (motionless),and 4 begins extending,following 7□8□40□400□4000□4000……,it is random for this extention and thus looking for the accurate value for 4□□3 in this system has lost meaning,However, the accurate value for 4000000……□□3 car be found in this system and this value is in the unit of 3 ,that is quantities that can divide exactly by 3.

Theorem □.7. It is known fron character 2 that the decimal point is meaningless in the system because the decimal point indicate the quantities that can not be exactly divided.This means that only integer exist and fraction and irrational number do not exist in the system.

Example □.8. Taking an example, For Fermat's big theorem $x^n + y^n = z^n$, since there are no decimal points to exist, its non-integer solutions are meaningless[4], so integer solutions must exist. I will give the exact integer sulutions of the Fermat's theorem in the next paper.

Theorem □.9. I draw the conclusion from character 2 that it is meaningless to compare with two quantities that dividend is less than divisor.

Theorem ▯.10. Seeing figure1. The existence of the infinitely small determine that number superposition is in the unit of superposition and this mean that superposition is truncated one.Thus I draw the conclusion that the system of axiom1 is non-continuum.

Theorem ▯.11. A given interval in the system can not be ‘included’ or ‘equal divided’ infinitely and randomly and it is non-existent that the whole quantities can be contained within an given system and for any two given dividend and divisor that is not divided exactly we must obtained the aliquot quantites that is integar times of this divisor by the way of extending dividend to infinitely great ,not to infinitesimal

Example ▯.12. For example,in the extent of 20, 20 can only be ‘included’ or ‘equal divided’ by 1,2,5,10. This mean that a given interval is finite quantites,for instance,1 meter long or 300,000 kliometers should be regard as the finite quantites.Taking another example, still considering 4▯▯3=?, the accurate value for 4▯▯3 can aslo not be found in the system of axiom1,but the accurate value for 4000000……▯▯3 can be found in this system and this value is in the unit of 3.Assuming this value is 13333……, then at this moment there are 4000000……/13333……=3,Within the range of 4000000……,one quantity 13333……4 that is beside 13333…… can not be divided exactly by 4000000……,Therefore,the defined value for 4000000……/13333……4 can not be found in the range of 4000000……,you must extend continuously from 4000000…… to more amount quantities to obtain the defined value for the integar times of 13333……4.At the same time, the defined value of the circular constant πcan not be found within an given circumferential lengths ,it can only be found in the quantities more than this given circumferential lengths by the way of extending this given circumferential lengths to infinitely great.As a result,this rule can be executed for random ratio quantities in the system of axiom 1.

Theorem ▯.13. It is inferred from uniqueness of infinitely small and infinitely great and character 6 that the formula for 1▯▯0= ∞▯▯1=∞ is non-existent and only ∞▯▯0=∞ is existent in axiom1. Here‘∞’indicates infinitely great.

Corollary ▯.14. It is the sample of axom2 in which the some length of space or time,such as 1 meter long,can be divided infinitely and randomly in the common sense .Meanwhile, it is aslo endowed in this sample by us that the sizes of space and time can be compared (namely there is small and great in sizes) in which axiom 1 and axiom 2 are co-existence(mixed). Some characters can be seen in this mixed axim1 and axiom2, such as the definite values of randomly ‘include’ and ‘equal divided’inside and outside an given system can be found wholly inside this system,decimal point have meaning, and two random quantities can be extended(enlarge and reduce)randomly on the basis of the same proportion,et al.

Example ▯.15. For instance, 1.3333…… and 1.3333……4 are meaningful and can be aslo found within one system that can be applied for any decimal and integar quantities within it .Taking an example,any decimal quantities can be included within an given system,such as the range of one meter long or 300,000 kliometers.

Corollary ▯.16. Therefore, I draw an conclusion that differential and integral calculus that are continuous calculation of dividend and divisor based on this mixed axim1 and axiom 2 has become not suitable because of existenence of axiom 1[5].

￿ Discussion

￿.1. Consequently,the space we see are made of countless 0 points of an non-continuum in spite of dimensions of space.There are the third implications here:

￿.2.Firstly,in the definition of axiom 2, for a given system, such as 1 meter long, can be divided into infinite smaller quantity, which means that the division can continue forever and do not stop, namely there is no minimum to exist. However,In the axiom 1, because of the existence of the minimum quantity (o point), 1 meter is considered as a finite quantities and cannot be divided infinitely.

￿.3.Secondly, The existence of decimal points is based on the concept of axiom 2 where the all quantities(including decimals) can be included in an given system(such as 1 meter long),so the number of decimal places and their numerical values here are independent of whether they are in or out of a system, whereas in axiom 1,decimal point is meaningless and there is only integer exist,which indicate an new quantity (algebra and geometry)distribution feature. For example, Considering the integar times of 0 in axiom 1, such as 21,212,2124,21247……,cannot be included and distributed within one system, that is, they belong to different systems, so in axiom 1, the size of the quantities determines the size of the system to which it belongs.

￿.4. Thirdly,these two aspects above are not limited to one dimension and zero dimension.

￿.5.To acquire all definite values in different sizes of space and time is the fundamental goal for mathematics.Some readers might ask,if existence of axiom 1 have some help to this goal? For example,1 meter long ,is speculated not being infinitely great in the common sense because of existence of the quantuties that is large than it. It is known from axiom1 that 1 meter long is finite quantity,and then how much is its definite values within the system?for another instance how much 4()3 and circular constant π? Some readers ask as well, infinitely small in axiom1 is 0(zero) point,that is point of 0(zero) dimension,and then in what position in the system of axiom1 is straight line ,plane surface,and even multidimensional curved surface we can see in the common sense ? The whole questions relate to illustration of the infinitely great in the axiom1.

￿.6 .Someone will doubt validity of axiom1 because of space and time is continuum we see in common sense, is not non-continuum.In addition,it is aslo obscure for us to understand the process of the extension from infinitely small to infinitely great,therefore,in the next paper,I will answer the above posed questions and try to give the definite values of each length or scale of space and time ,particularly concerning the define values of infinitely great.

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References

1 Pysialk L, Sasin W, Heller M, Functorial Differential Spaces and the Infinitesimal Structure of Space-Time. Rep Math Phys,2020,85(3): 443-454

2 Hughes D, A minimal classical sequent calculus free of structural rules. Ann Pure Appl Logic, 2010,161(10): 1244-1253

3 Wrobe M, Divisor class groups of rational trinomial varieties. J Algebraic Geom, 2020,542: 43-64.

4 Wiles A, Modular elliptic curves and Fermat’s Last Theorem. Ann Math,1995,141(3): 443-552.

5 Sellés M A ,Infinitesimals in the foundations of Newton's mechanics. Hist Math,2006,33(2): 210-223.

Figures

Figure 1

In order to describe briefly,‘0’is expressed by‘|’. The process of the extension from infinitely small to infinitely great is indicated in this figure.

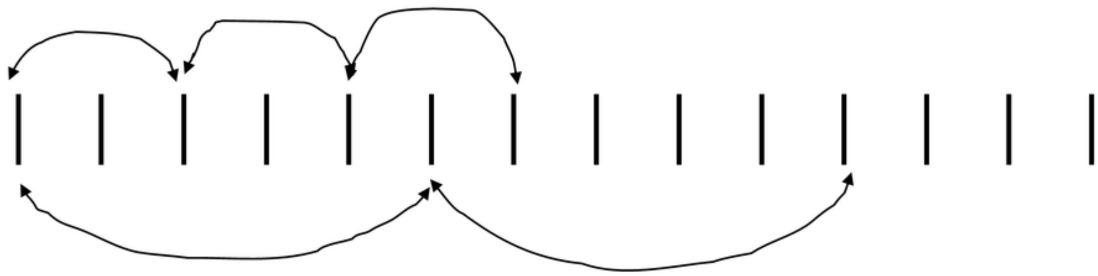

Figure 2

The extension only can be executed in the way of unit superposition in the system . the next extension quantities for 2▯▯1 is 4▯▯2,again the next is 6▯▯3,an so on. .For another instance, ,the next extension quantities for 5▯▯1 is 10▯▯2,again the next is 15▯▯3,an so on

Figure 3

To calculate the accurate value for 4[illegible]3,3 is not allowed to extend (motionless),and 4 begins extend. The accurate value for 4000000……[illegible]3 can be found in this system and this value is in the unit of 3 .