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The most general set

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Abstract:

In this article we will introduce a new type of the set which is the most general. We will study some operations on this type of the new set. We will study a new type of algebra on this set. Also the algebra depend on the time will be discussed. We will present some applications on the new set. The manifold defined in the new set is presented in this paper.

Keywords:

Set, graph.

Introduction:

The theory of sets as a mathematical discipline was developed by Georg Cantor (1845-1918) in a series of remarkable papers published between 1873 and 1897. Cantor introduced the notion of the set to distinguish between different kinds of infinite numbers and to extend the operations of ordinary arithmetic to them. The first sentence of his major work Contributions to the Founding o the Theory of Transfinite Number (1895) contains his classic definition: "By an aggregate [set] we are to understand any collection into a whole M of definite and distinct object m of our intuition or thought." That is, a collection of objects, even an infinite collection, is conceived of as a single entity. Cantor's insistence on treating infinite sets as mathematically permissible objects on a par with finite sets ad counting numbers departed radically from standard interpretations and brought forth a storm of protest from his contemporaries. One of Cantor's former professors at Berlin, Leopold Kronecker, considered Cantor a scientific charlatan, a renegade, and a "corrupter of youth." (As a result of continuing animosity such as this, Cantor suffered period of mental breakdown and spent the last five years of his life in a sanatorium.) Fortunately, Cantor's bold step was welcomed by others; David Hilbert, the leading mathematician of his day, declared stoutly, "No one shall expel us from the paradise which Cantor created for us."

About the turn of the century, just when Cantor's ideas were beginning to gain acceptance, a number of entirely unexpected logical contradictions, termed "paradoxes," were discovered on the fringes of set theory. In his desire to produce a concept as general as possible, Cantor had allowed any collection to be a set. He intuitively assumed that if one could describe a sensible property of objects, the one could also speak of the set of all objects that possess the property. This naïve and unsystematic

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approach led to upsetting consequences. Certain "Large" collections, such as the "set of all set," had to be discarded to circumvent the troublesome paradoxes. The remedy was to construct a sufficiently restrictive system of postulates for deciding which objects were to be regarded as sets and what properties sets should have. The leader of the movement of rehabilitation was Ernst Zermelo (1871-1953), who published the first axiomatic treatment of set theory in 1908. Zermelo's system of axioms later (1922) required strengthening by Abraham Fraenkel, giving rise to a list of codifying assumptions, widely used up to the present day, that are known as the Zermelo-Fraenkel axioms.

Rather than attempting to list the undefined notions of set theory and the various axioms relating them, we shall take an informal approach to the subject. To this end, the set will be understood to mean any identifiable collection of objects of any sort. The objects that make up a particular set are called its elements or members. (Almost every attempt to give an intuitive explanation of the word "set" results in replacing it by a synonym such as "collection," or "class"; the least painful attitude is to accept the terms "set" and "element" as primitive, undefined concepts.)

Sets will generally be designated by capital italic letters and their elements by lowercase letters. A few sets occur so frequently that it is a good idea to establish a fixed notation for them:

Z	the set of integers
Q	the set of rational numbers
$R^{\#}$	the set of real numbers

will stand for the positive elements of these sets. $R^{\#}_{+}$ The symbols Z_{+}, Q_{+}, and

If *x* is an element of the set *A*, it is customary to employ the notation $x \in A$ and to read the symbol $\in$ as "belongs to". On the other hand, when *x* fails to be an element of the set *A*, we shall indicate this situation by writing $x \notin$ A.

The use of $\in$ (a stylized form of the Greek epsilon) to denote the membership relation was initiated by the Italian Logician Giuseppe Peano in 1889; it abbreviates the Greek word εστι, which means "is." We will discuss a new type of the set.

Definitions:

Empty set or null set: it is having no elements at all and it is represented by the symbol Ø.

Subset: we say that the set A is subset of the set B and we write $A \subseteq B$ provided that every element of A is also an element of B.

Union: the union of A and B denoted by A ∪ B such as A ∪ B = $\{ x \mid x \in A$ or $x \in$ B$\}$.

Intersection: the intersection of A and B denoted by $A \cap B = \{ x \mid x \in A$ and $x \in$ B$\}$

Difference: the difference of A and B is denoted by $A - B = \{x \mid x \in A$ and $x \notin B\}$.

Complement: the complement of A is called the particular difference and is denoted by $U - A = \{x \mid x \in A$ and $x \notin A\}$.

Main results:

We will define the new sets and the operators on these sets.

Definitions:

We will introduce the generalization union and the general intersection of two new sets.

Case 1:

Let A and B be a non empty sets such that A = {a_1, a_2, a_3} and B = {b_1, b_2, b_3}, A $\neq$ B and $B \not\subset A$, we said A $\bar{\cup}$ B = A, if every element in A cancel the corresponding element in B.

Example 1:

Let A = {Red sea, Atlantic ocean, Mediterranean sea} and B = {ston1, ston2, ston3} then {Red sea, Atlantic ocean, Mediterranean sea} $\bar{\cup}$ {ston1, ston2, ston3} = {Red sea, Atlantic ocean, Mediterranean sea} i.e. A $\bar{\cup}$ B $= A$, for ston1 + Red sea = Red sea, ston2 + Atlantic ocean = Atlantic ocean and ston3 + Mediterranean sea = Mediterranean sea. From this definitions we will define the general group which a + b = a, b is not the identity and a + b = b + a = a, b is not the identity for example Red see + water drop = Red see. The algebra belt on this type of operation is the general special type of algebra, ($\bar{G}$, O), ($\bar{F}$, O, $\bullet$**)** are the general group, general field.

Theorem 1:

The algebraic structure is a special type of a general one.

Proof:

Let (G,O) is an algebraic structure such that $x, y \in G$ let $xoy = x$, $y \neq e$, if $y = e$ $\Rightarrow xoe = x$, $xoy = x$ is the closed operation which is a special case. The pure identity element is e the another element plays instead of e is y, $y \neq e$, then y is the big identity.

Case 2:

Let A and B be a non empty sets such that A = {a_1, a_2, a_3} and B = {b_1, b_2, b_3}, $A \neq B$ and $A \not\subset B$, we said A $\bar{\cup}$ B = B, if every element in B cancel the corresponding element in A. In theorem 1 $xoy = y \Rightarrow x$ plays as the big identity.

Example 2:

Let A = {injection1, injection2, injection3} and B = (man1, man2, man3), then {injection1, injection2, injection3} $\bar{\cup}$ {man1, man2, man3} = (man1, man2, man3) i.e. A $\bar{\cup}$ B =B, for injection1 + man1 = man1, injection2 + man2 = man2 and injection3 + man3 = man3.

Case 3:

Let A and B be a non empty sets such that A = {a_1, a_2, a_3} and B = {b_1, b_2, b_3} and $A \neq B$, we said A $\bar{\cup}$ B = $\{x : x \notin A$ and $x \notin B\}$ i.e. A $\bar{\cup}$ B = {s_1, s_2, s_3} such that

$s_i \notin A$ and $s_i \notin B$, i = 1,2,3 for the existence of a_1 with b_1 will be s_1, the existence of a_2 with b_2 will be s_2 and the existence of a_3 with b_3 will be s_3.

Example 3:
Let A = {Color red, Color black} and B = {Color blue, Color white} then {Color red, Color black} $\bar{\cup}$ {Color blue, Color white} = {Color purple, Color gray} i.e. A $\bar{\cup}$ B = $\{s_1, s_2\}$ such that $s_i \notin A$ and $s_i \notin B$, i = 1,2 for Color red + Color blue = Color purple and Color black + Color white = Color gray.

Case 4:

Let A and B be a non empty sets such that A = $\{a_1, a_2, a_3\}$, B = $\{b_1, b_2, b_3\}$ and $A \neq B$ but of the same type, we said A $\bar{\cup}$ B = S such that S is the set but not of the same type of the set A and B, therefore we can consider A $\bar{\cup}$ B = Ø such that Ø is the empty set of the same type of the set A and B but not of the same type of S i.e elements in A and elements in B give anther elements in anther type which named empty set in the type A and B.

Example 4:
In Chemistry, for example, we find that a union of elements with other elements given compounds and also the Union of corns with other corns given molecules, i.e. the result of the union particular type N gives anther type K, which named empty set in the type N.

Theorem 2:
The union of two sets $A \neq \Phi$ and $B \neq \Phi$ is empty set.

Proof:
Let A and B be a non empty sets which A = $\{a_1, a_2, \ldots, a_n\}$ and B = $\{b_1, b_2, \ldots, b_n\}$ such that a_1 and b_1 cancel together, a_2 and b_2 cancel together b_2, …, a_n and b_n cancel together, then A $\bar{\cup}$B = Ø .Or the union of elements A and B gives anther type of elements then also A $\bar{\cup}$B = Ø.

Case 5:

Let A and B be a non empty sets such that A = $\{a_1, a_2, a_3\}$, B = $\{b_1, b_2, b_3\}$ and $A \neq B$.

We said A $\bar{\cup}$ B = $\{a_1, b_3\}$ such that $A \not\subset$ A $\bar{\cup}$ B and $B \not\subset$ A $\bar{\cup}$ B, for a_2 and b_2 cancel together and a_3 and b_1 cancel together.

Theorem 3:

In the genera algebra $A \subset$ A $\bar{\cup}$ B, $B \subset$ A $\bar{\cup}$ B, A $\bar{\cup}$ B $\subset B$ and A $\bar{\cup}$ B $\subset A$ are not necessary satisfied such that A and B are a non empty distinct sets.

Proof:
In algebra we have $A \subset$ A$\cup$B and $B \subset$ A$\cup$B for any sets A and B. We suppose A = $\{a_1, a_2, a_3\}$ and B = $\{b_1, b_2, b_3\}$ which (a_2 and b_2) cancel together and (a_3 and b_3) cancel together then A $\bar{\cup}$ B = $\{a_1, b_1\}$ its imply $A \not\subset$ A $\bar{\cup}$ B, $B \not\subset$ A $\bar{\cup}$ B, A $\bar{\cup}$ B $\not\subset B$ and A $\bar{\cup}$ B $\not\subset B$.

On time algebra:

Now we will introduce a new algebra it is algebra which depends on time. We have many cases:

Case 1:

Let A and B be a non empty sets such that A = $\{a_1, a_2, a_3\}$, B = $\{a_1, b_1, a_3\}$ and $A \neq B$. If a_1 and a_2 cancel together in the set A after t time i.e. the set A becomes $\{a_3\}$, then $A \overline{\cap} B = \{a_3\}$. In the same way, we said A $\overline{\cup}$ B $= B$.

Case 2:

Let A and B be a non empty sets such that A = $\{a_1, a_2, a_3\}$, B = $\{a_1, a_2, b_1\}$ and $A \neq B$. If a_1 and a_2 cancel together in the set A and in the set B after t time i.e. the set A becomes $\{a_3\}$ and the set B becomes $\{b_1\}$, then $A \overline{\cap} B = \varphi$. In the same way, we have A $\overline{\cup}$ B = $\{a_3, b_1\}$.

Case 3 :

Let A and B be non empty sets such that A = $\{a_1, a_2, a_3\}$, B = $\{a_1, b_1, b_2\}$ and $A \neq B$. If the element a_1 dies in the set A and in the set B after t time i.e. the set A becomes $\{a_2, a_3\}$ and the set B becomes $\{b_1, b_2\}$, then $A \overline{\cap} B = \varphi$. In the same way, we have A $\overline{\cup}$ B = $\{a_2, a_3, b_1, b_2\}$.

Case 4 :

Let A and B be anon empty sets such that A = $\{a_1, a_2, a_3\}$, B = $\{b_1, b_2, b_3\}$ and $A \neq B$. If the element a_1 is generated b_1, b_2, b_3 after time t i.e. the set A becomes $\{a_1; b_1, b_2, b_3; a_2; a_3\}$, then $A \overline{\cap} B = B$.In the same way, we have A $\overline{\cup}$ B = $\{b_1, b_2, b_3, a_2, a_3\}$.

Theorem 4:

In algebra which changes by the time we find all D.Morgan's laws changed by the time.

Proof:

Let A and B be a non empty distributive sets in X. Let A = $\{a_1, a_2, a_3\}$, B = $\{b_1, b_2, b_3\}$ such that $A \neq B$, $A \subseteq X$ and $B \subseteq X$. We have A ∪ B = $\{a_1, a_2, a_3, b_1, b_2, b_3\}$, but after time t the union will become A $\overline{\cup}$ B = $\{a_1, b_1\}$, for (a_2 and b_2) cancel together and also (a_3 and b_3) cancel together. Then $(A \overline{\cup} B)^C = \{a_2, a_3, b_2, b_3, c_1, c_2, c_3\}$. We have $A^C = \{c_1, c_2, c_3, b_1, b_2, b_3\}$, $B^C = \{a_1, a_2, a_3, c_1, c_2, c_3\}$ and $A^C \cap B^C = \{c_1, c_2, c_3\}$, but after time t the intersection will become $A^C \overline{\cap} B^C = \{c_1, c_2\}$, for c_2 cancel c_3.

Then $(A \overline{\cup} B)^C \neq A^C \overline{\cap} B^C$, see Fig.(1).

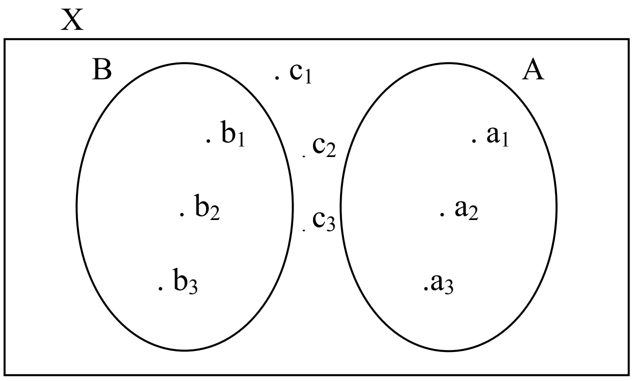


Fig.(1)

Let A and B be two sets in X. Let A = $\{a_1, a_2, a_3, c_1, c_2, c_3\}$ and B = $\{b_1, b_2, b_3, c_1, c_2, c_3\}$ such that $A \subseteq X$ and $B \subseteq X$. We have $A \cap B$ = $\{c_1, c_2, c_3\}$, but after time t the intersection will become $A \overline{\cap} B$ = $\{c_3\}$, for (c_1 and c_2) cancel together. Then $(A \overline{\cap} B)^C$ = $\{a_1, a_2, a_3, b_1, b_2, b_3, c_1, c_2\}$. We have $A^C = \{b_1, b_2, b_3\}$ and $B^C = \{a_1, a_2, a_3\}$, then $A^C \cup B^C = \{a_1, a_2, a_3, b_1, b_2, b_3\}$, but after time t the union will become $\{a_1, a_2, b_1, b_2\}$ for (a_3 and b_3) cancel together. Then $(A \overline{\cap} B)^C \neq A^C \overline{\cup} B^C$, see Fig.(2).

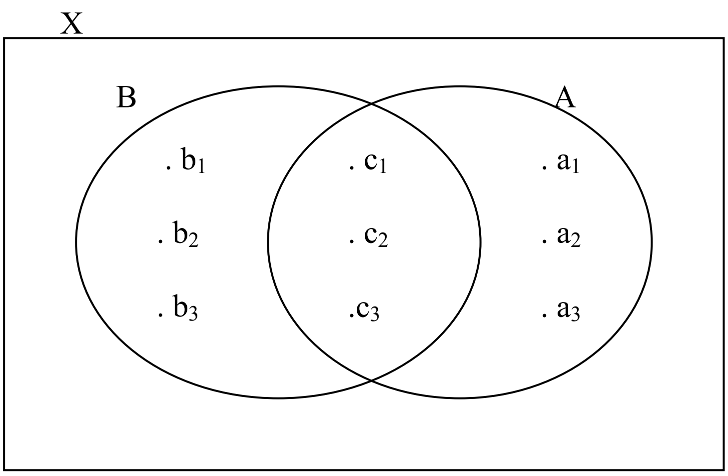


Fig.(2)

On time manifold:

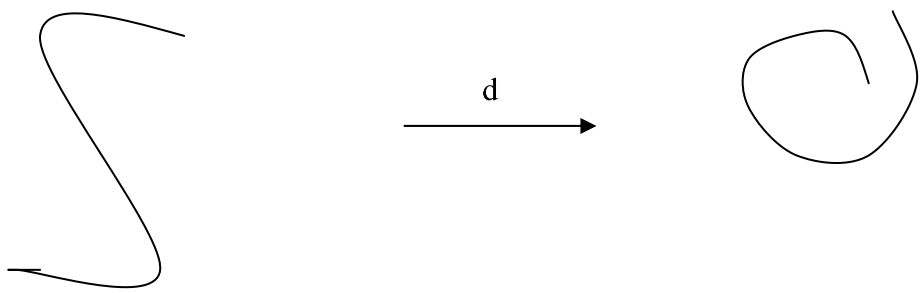
The manifold is a pair (U_i, Φ_i), where U_i are open sets in R^n, and Φ_i are continuous functions $\Phi_i : R^n \to R^n$ it is a dynamical topological manifold if Φ_i are differentiable, then it is a differentiable manifold. The manifold looks like island in an ocean, then this island decreases by the time or increases in its area.

Theorem 5:

Under the change of time the manifolds changed in all parameters (curvature, torsion, ...).

Proof:

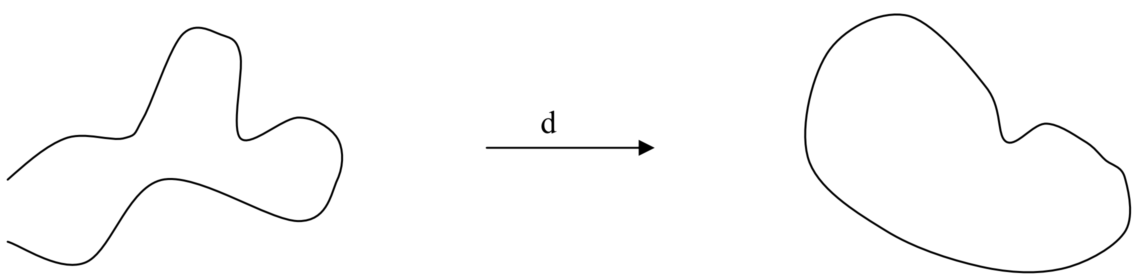
Consider a manifold M with structures (U_i, Φ_i) after time t (U_i, Φ_i) $\to$ ($\overline{U}_i$, $\overline{\Phi}_i$), where U_i, $\overline{U}_i$ are homeomorphic and Φ_i, $\overline{\Phi}_i$ are defeomorphic then $\overline{M}$ is defeomorphic to M. If $\Phi_i = \Phi_i(t)$, then it is changed after time t_1, $\to \overline{\Phi}_i(t)$, see Fig.(3). d: $\Phi_i \to \overline{\Phi}_i$,



$\Phi_i(t)$ $\overline{\Phi}_i(t)$

Fig.(3)

Then the curvature of $\Phi(t)$ = k, but the curvature of $\overline{\Phi}(t) = \overline{k}$ if $\Phi(t, u)$, Then $\Phi(t, u)$ represent a 2-manifolds after time t, see Fig.(4).



$\Phi(t, k)$ $\overline{\Phi}(t, k)$

Fig.(4)

d: $\Phi(t, k) \to \overline{\Phi}(t, k)$,

Since the manifold is a Hausdorff topological space and the sets changed by the time then the manifold will change by the time.

Theorem 6:
The limit of changes of a manifold M^n of dimension n by the time is M^{n-1} or M^{n+1}.
Proof:
Let M^n be a manifold of dimension n, after time t, then $M^n \rightarrow M^{n+1}$, see Fig.(5). Or $M^n \rightarrow M^{n-1}$, see Fig.(6).

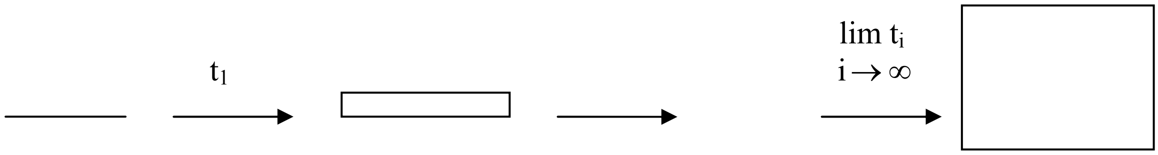


Fig.(5)

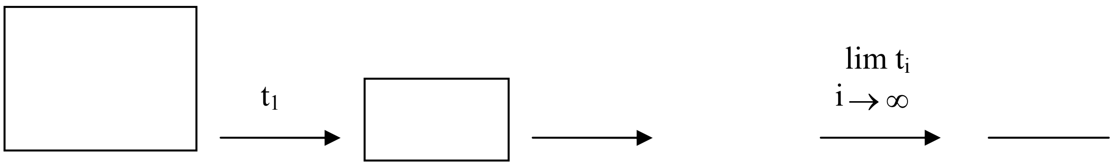


Fig.(6)

Applications:

1) Consider a manifold which represent island in an ocean under the change of time the water will decrease the area of island or increase it. The limit of this change will be a point in the ocean.
2) The leave of the tree in some time will be as in Fig.(7) after another time will be as in Fig.(8) or will be in Fig.(9) in which K (curvature) changed also τ (torsion) changed.

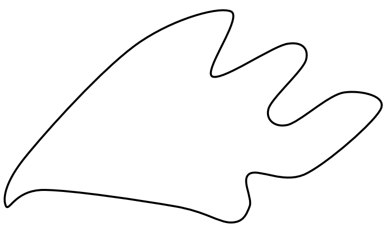


Fig.(7)

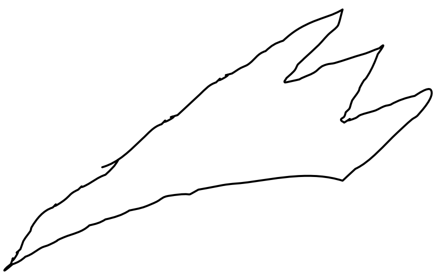


Fig.(8)

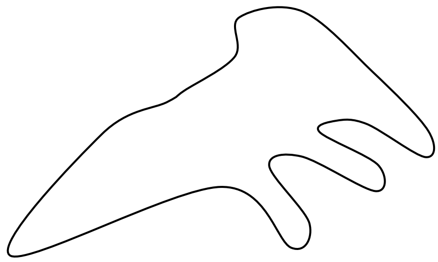


Fig.(9)

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