

Infinity

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1. Limit Point of a Sequence

Definition

A sequence $\langle S_n \rangle$ is said to be Converge to a number l , if for any given $\epsilon > 0$, \exists a positive integer m such that $|S_n - l| < \epsilon$, $\forall n \geq m$.

The number l is called the limit point of the sequence $\langle S_n \rangle$.

Let, $\langle S_n \rangle = \langle \frac{1}{n} \rangle$

And we know,

$$\lim_{n \rightarrow \infty} \frac{1}{n} = 0 \longrightarrow (1)$$

Now from the definition,

(1) $\Rightarrow |\frac{1}{n} - 0| < \frac{1}{an}$, $\forall n \geq m$ and where 'a' is a very very large Positive even number.

$$\Rightarrow |\frac{1}{n}| < \frac{1}{an} + 0, \forall n \geq m.$$

If we take positive value of $|\frac{1}{n}|$ then the inequality shows a Contradiction.

Therefore, $-\frac{1}{n} < \frac{1}{an} + 0, \forall n \geq m$

$$\Rightarrow -\frac{1}{n} - \frac{1}{an} < 0, \forall n \geq m$$

$$\Rightarrow \frac{-a-1}{an} < 0, \forall n \geq m$$

$$\Rightarrow \left\{ \frac{-(a+1)}{an} \right\} \frac{1}{n} < 0, \forall n \geq m$$

$$\Rightarrow \frac{1}{n} < 0, \forall n \geq m \quad [\text{Since, "a" is a positive even number}]$$

$$\Rightarrow n < 0, \forall n \geq m \longrightarrow (2)$$

Since, $n \rightarrow \infty$ [From (1)]

$$(2) \Rightarrow \infty < 0$$

[Let I is a very large number then, $I < S(I) < S(S(I)) < \dots < \infty$]

$$\therefore \infty = 0$$

Theorem 1

Equal numbers are opposite and opposite numbers are complete.

Let, $n \in \mathbb{N}$

And, $n = n$

$$\Rightarrow n - n = 0$$

$$\Rightarrow n + (-n) = 0 \quad (a)$$

Right hand side of (a) is zero, therefore left hand side of (a) is composition of two opposite number.

And Composition of two opposite is complete because is equal to zero.

Theorem 2

Empty is complete number

i.e. $\mathbb{R} \in 0$

Let $a \in \mathbb{R}$, where a is any real number.

And we define zero as

$$-a \leq 0 \leq a \quad (3)$$

$$(3) \Rightarrow -a \leq 0 \text{ and } 0 \leq a \longrightarrow (4)$$

$$\Rightarrow |-a| \leq |0|$$

$$\Rightarrow a \leq 0 \longrightarrow (5)$$

[since, concept of everything is circle]

$$\text{From (4) \& (5), } 0 \leq a \leq 0 \longrightarrow (6)$$

i.e., $a \in 0$, since $a \in \mathbb{R} \Rightarrow \mathbb{R} \in 0$.

$$\text{And also (6) } \Rightarrow a = 0 \longrightarrow (7)$$

Zero is neither positive nor negative it means an empty. And (7) shows "a" is exactly equal with zero. Therefore the "a" at the same time both positive and negative because 0 is empty)

And we can write it as

$\pm a = a$ [Because of "a" neither positive nor negative therefore "a" is meaningless or vacuously true] (8)

Lemma 1: Positive and negative is the same.

$$(8) \Rightarrow \pm a = a$$

But we know as

$$+a = a$$

$$\therefore \pm a = +a \longrightarrow (1.1)$$

Now we know

If $a \in \mathbb{R}$ (where a is any number)

Then either $+a \in \mathbb{R}$ or $-a \in \mathbb{R} \rightarrow (1.2)$

All opposite numbers are equal

But from the theorem (2)

Zero opposite of infinity

If $a \in \mathbb{R} \Rightarrow \pm a \in \mathbb{R} \longrightarrow (1.3)$

$\therefore 0 = \infty$

$\therefore \pm a = +a$ [From (1.2) and (1.3)]

Or $\pm a = -a$

Hence, $+a = -a$

Consciously the conclusion is, if n is any natural number then $n \Leftrightarrow -n$.

From the above concept and the set Analysis

If a is only possible and a complete number then the number “ a ” is a composition of $+a$ and $-a$ [from the theorem (2)]

At minimum math with a minimum element the theorem (2) form on set theory as,

$$\Phi = \{\Phi, a, -a\} \longrightarrow (i)$$

And the total math is,

$$f(0) = \begin{cases} +a \geq \pm a \\ -a \leq \pm a \end{cases} \longrightarrow (*)$$

2. Analysis

Now $\frac{a}{0}$ (where a is an any number); In here zero is a complete And ‘ a ’ making a relation with that complete. Therefore, because of theorem (2) $a \in 0$. And from eqⁿ (1.1), (i) and (*) the value of $\frac{a}{0}$ is $+a$ and $-a$ and we can written it as $\pm a$.

For $P(n) = 1$

$$\pm 1 = \pm 1$$

$$\Rightarrow \frac{-1}{0} = \frac{1}{0}$$

$$\Rightarrow -1 = 1$$

For $P(n) = k$, where k is any natural number

$$\pm k = \pm k$$

$$\Rightarrow \frac{-k}{0} = \frac{k}{0}$$

$$\Rightarrow -k = k$$

For $P(n) = (k+1)$, where k is any natural number

$$\Rightarrow \pm(k+1) = \pm(k+1)$$

$$\Rightarrow \frac{-(k+1)}{0} = \frac{(k+1)}{0}$$

$$\Rightarrow -(k+1) = (k+1)$$