

Re: abundance of irrationals!)

Source: <http://sci.tech-archive.net/Archive/sci.math/2005-04/msg02431.html>

- *From:* Virgil <ITSnetNOTcom#virgil@xxxxxxxxxxx>
 - *Date:* Sat, 16 Apr 2005 14:31:56 -0600
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In article <fb701d3c.0504160218.7078010d@xxxxxxxxxxxxxxxxxxxxxx>, mueckenh@xxxxxxxxxxxxxxxxxxx (W. Mueckenheim) wrote:

> "r.e.s." <r.s@xxxxxxxxxxxxxxxxxxx> wrote in message
> news:<1WB7e.6258\$IP1.6049@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx>...
>
>> That produces a *string* of infinite length, namely $s = 0.111\dots$,
>> (with a 1 in the n th position to the right of the radix point for
>> every n in $N = \{1,2,3,\dots\}$. Since no limit is to be taken, s is
>> merely an infinite string with no numerical value yet defined.
>>
>>
>>> Take $\text{Sum } b_k * 10^{-k}$ without letting k become actually infinite.
>> Rather,
>> "Take $\text{Sum } 2^{-k}$ without letting k become actually infinite."
>>
>> How, exactly?
>> Please *define* what you mean by that, without taking a limit.
>> (You do know that taking a limit with $k \rightarrow \infty$ does *not* involve
>> "letting k become actually infinite", right?)
>
> It does involve ∞ . Because we have for any finite natural number n :
>
> n
> $\text{SUM } 1/2^k = 1 - 1/2^n < 1$
> $k = 1$
>
> independent of the question how many terms contribute to the sum. The
> criterion for obtaining the $\text{Sum} = 1$ is not the infinitude of terms to
> add but that in the limit $1/2^n = 0$ which is impossible for any
> natural number.

Wrong! That is not how limits are defined.

A series is defined in mathematics as a sequence of the partial sums of another sequence. Given sequence $f:N \rightarrow R$, we construct series $g:N \rightarrow R$ by defining $g(n) = \text{SUM}_{\{1 \leq k \leq n\}} f(k)$.

Thus every series is a special type of sequence, and no series can exist

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which are not sequences of partial sums, at least in mathematics. That in Meucken's mind there may be some other meaning is mathematically irrelevant.

Then the "sum", if it exists in any sense, of a series is defined as the limit of the sequence of partial sums. The "sum" or "value" or whatever, of a series has no other mathematical meaning. That in Meucken's mind there may be some other meaning is mathematically irrelevant.

Meucken, you have no power to impose your vision of what mathematics should be on mathematics. Mathematics has progressed nicely without your help for millennia, and will continue to do so without you nicely.

• **References:**

- ◆ **Re: abundance of irrationals!)**
◇ From: W. Mueckenheim
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◇ From: Dik T. Winter
- ◆ **Re: abundance of irrationals!)**
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