Re: ** says: Definition: sum{i in N} i = 0

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- *From*: WM <mueckenh@xxxxxxxxxxxxxxxxx>
- *Date*: Mon, 09 Jul 2007 00:52:39 −0700

On 9 Jul., 07:32, hagman <goo...@xxxxxxxxxxxxx> wrote:

> On 8 Jul., 22:50, WM <mueck...@xxxxxxxxxxxxxxxxx> wrote:
>
> > > > On the contrary it is simple because Cantor
> > > > himself considered his
> > > > proof an existence proof for trancendental
> > > > numbers.
> >
> > > Well, but that does not make transcendental number the
> > > *cause* for
> > > the uncountability of the reals.
> > > For example, the existence of transcendentals is also possible
> > > by approximation theory: sum 10^(−n!) is transcendental.
> > > Thus transcendental numbers exist. But this tiny fact doesn't
> > > prove uncountabilty of the reals.
> >
> > Of course only the (asserted) existence of *all* transcendentals makes
> > R uncountable. Those few transcendentals which were constructed by
> > Liouville himself and the handful being found later on by Hermite, v.
> > Lindemann, Schneider, Gelfand and others is certainly not sufficient
> > to make anything uncountable. (By the way, it was Liouville's aim
> > already to prove e transcendental.)
>
> Let a_0 be a sequence of ones and twos.

You meant (a_n)?

> Then
> sum a_n*10^(−n!)
> is transcendental of Liouville type and the set of these is

> uncountable,
> of course by the same diagonal argument as used for the reals
> themselves.

The set of all infinite sequences (a_n) of this kind is uncountable. For this sake you need not append any "*10(−n!)". But Liouville (and all his followers), restricted to human limitations, could not construct the set of all these sequences (a_n) but only a finite subset of them. Therefore the set of numbers constructed by him and his followers is not uncountable.

Regards, WM

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