Re: Cantor was Right!

Source: http://sci.tech−archive.net/Archive/sci.math/2005−05/msg04704.html

---

- *From*: Tony Orlow (aeo6) <aeo6@xxxxxxxxxxx>
- *Date*: Wed, 25 May 2005 11:36:19 −0400

---

anzaurres1@xxxxxxxxxxx said:
> Tony Orlow (aeo6) wrote:
> > anzaurres1@xxxxxxxxxxx said:
> > > Look. If I came to sci.physics, claiming that I have a refutation of
> > > the idea that atoms contain nucleii and then admitted that I don't know
> > > what an atom is, I would be laughed out of sci.physics, wouldn't I?
> > >
> > > That's exactly what you are doing at sci.math. The concept of a Cauchy
> > > sequence is the basis for understanding real numbers. If Cauchy
> > > sequences didn't have limits, real numbers could very well be countble.
> > > But because they do − the real numbers are uncountable.
> > >
> > > Explain something to me. Judging by your interest in the countability
> > > of real numbers, you are a fan of mathematics and real numbers. Then
> > > why have you denied yourself the real pleasure of learning what other
> > > people, interested in math, have discovered about real numbers? And I
> > > don't mean anything advanced. Just your basic sophomore calculus.
> > >
> > > Why do you have time to post zillions post to sci.math but don't have
> > > time to learn calculus? Wouldn't learning be more fun?
> > >
> > >
> > I have leanred a lot here, actually. It's a long time since i have been able to
> > afford to go to school, and now have a good sized family to take care of. The
> > countability of the reals is something that perhaps I am not understanding. It
> > seems to depend on there being only finite numbers of digits in each, to be
> > countable?
>
> If you define reals as sequences of decimal digits, yes. Sort of. That
> is, if you consider only the numbers that have finite numbers of digits
> in them, then this set is countable.

That seems rather arbitrary, especially in light of the fact that an infinite
set of naturals necessarily contains infinite naturals, and therefore, by this
thinking, is uncountable. Is this why you cling to your concept of finite
naturals, while claiming the set is infinite, so you can pretend to be talking
about infinity?
>
> But the converse is not true. The set of rational numbers contains
> members whose expression in decimals is infinite, such as 1/3 or 1/7.

> Yet this set is still countable.
Even if the numerators and denominators can assume infinite values?
>
> In any case, defining reals as infinite sequences of digits may not be
> the best way to go. I don't remeber why but I remember that it wasn't.
There are issues with it. Using different number bases yields different results for the relative size of the reals to the naturals. In binary, we think R=2^N, but in decimal R=10^N. So, this does not seem to provide a clear unambiguous description of their realtive sizes. Ultimately, the digital number systems are "potential" enumerations of the infinite set, as they are "potential" enumerators of the integers. The enumeration I referred to yesterday under fire yields 2^N, regardless of any arbitrary number base chosen, and yet, this is not satisfactory to me, since that is the size of the set mapped using f(x)=log2(x).
It is my opinion that no function short of
f(x)=log(log(log(......(x))))...., or perhaps f(x)=x+0, can possibly fully populate the reals as a mapping from the integers.
>
> I forgot most other, more productive ways to define reals in terms of
> rationals. Russian textbooks are usually very good at that. It's been
> many decades since I went through these different definitions and
> derivations.
>
> But what I find important is that any Cauchy sequence of rational (or
> real) numbers has a real−valued limit.
>
> A sequence A1, A2, A3, ... of numbers is Cauchy if for any e > 0,
> there exists an index i such that |Aj − Ak| < e for any k > i and j >
> i.
>
> An interpretation is that a Cauchy sequence is "asking for a limit".
I will have to investigate this more when time permits.
>
> > I am not sure what the criterion is, but I have come up with a nice
> > enumeration of them that I hope will turn into something useful.
>
> My advice to you is to give it up.
Real helpful. Thanks.
>
> Why? For example, wasn't it you who told me that if the set of reals
> were enumeratable, then the area of the 1 x 1 square is equal to 0?
Huh? Uh, no, I don't recall making any such statement. Maybe you inferred that from something I said.

>
> That can't be so, can it?
Nope. The area is dependent on the unit of measurement. A 1x1 square is a unit area.
>
> Do you REALLY think that a square 1 foot x 1 foot has area equal to 0
> square feet?!

No.
>
> Or do you think that basic human notion of area is false or
> self−contradictory?
No. This is another example of being asked to defend a position I never held.
Perhaps you can point me to what I said that you misunderstood.
>
>

−−
Smiles,

Tony
.

- ***Follow−Ups***:
  - ***Re: Cantor was Right!***
    - *From:* anzaurres1
  - ***Re: Cantor was Right!***
    - *From:* Virgil

- ***References***:
  - ***Cantor was Right!***
    - *From:* Frank J. Lhota
  - ***Re: Cantor was Right!***
    - *From:* aeo6
  - ***Re: Cantor was Right!***
    - *From:* anzaurres1
  - ***Re: Cantor was Right!***
    - *From:* aeo6
  - ***Re: Cantor was Right!***
    - *From:* anzaurres1
  - ***Re: Cantor was Right!***
    - *From:* aeo6
  - ***Re: Cantor was Right!***
    - *From:* anzaurres1
  - ***Re: Cantor was Right!***
    - *From:* aeo6
  - ***Re: Cantor was Right!***
    - *From:* anzaurres1

- Prev by Date: ***L^1, L^2 convergence***
- Next by Date: ***Re: Cantor was Right!***
- Previous by thread: ***Re: Cantor was Right!***
- Next by thread: ***Re: Cantor was Right!***
- Index(es):
  - ***Date***
  - ***Thread***