# Re: Cantor's diagonal proof wrong?

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***From:*** Shmuel (Seymour J.) Metz (*spamtrap_at_library.lspace.org.invalid*)
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Date: Mon, 15 Nov 2004 17:35:01 −0500

In <20041114013915.877$0a@newsreader.com>, on 11/14/2004
at 06:39 AM, curt@kcwc.com (Curt Welch) said:

*>Nath is not something I specialize in (and I don't read this group*
*>normally), but I've been looking at a few things lately and I've*
*>decided that some very big mistakes have been made in math because*
*>people started playing around the concept of infinity without*
*>realizing the trouble they were creating for themselves.*

In this case, that is a sign that you understand neither the
vocabulary nor the reasoning.

*>But, like I said, I'm not a math expert by any means. So I'm*
*>posting the idea here so you experts can have fun laughing at me.*

The problem is that the circle squarers[1] and the angle trisecters[1]
ceased being funny centuries ago.

*>The reason I came to these conclusions is because I've spent a lot*
*>of time trying to uncover the mysteries of AI*

totally unrelated.

*>basic assumptions on what an idea is*

Mathematics is not psychology. Mathematics does not concern itself
with ideas, but with proofs.

*>So you just reverse the digits in the integer to create the real. I*
*>claim this mapping is one to one and covers all the reals in that*
*>range.*

Your claim is false. You don't understand what an integer is.

*>So, this proves that D(n) for all values of n, from 0 to infinity,*
*>is in the table.*

Here's where you go wrong. Infinity is not an integer, and there is no D(oo).

*>Cantor's proof says that D(infinity) is not in the table,*

That's not even wrong. There is no D(oo) to not be in the table, because you haven't defined it.

*>D(n) for all values of n, including infinity,*

You haven't defined D(oo). Were you to define D(oo) to be the limit of D(n), you would find that it is not in the table, but that would not support your conclusion.

*>Lets create a table of integers like this:*

Again, you don't understand what an integer is. A string of digits is just a string of digits, not an integer. You can certainly represent an integer as a string of decimal digits, but such a string will have only a finite number of nonzero digits.

*>It's just a normal list of integers, but instead of following the*
*>normal convention of leaving off the leading zeros (which we all*
*>know are implied even if we don't write them) I include them in that*
*>table.*

They aren't implied, they're irrelevant. Both '12' and '012' are valid decimal representations of twelve. Neither one is twelve.

*>So lets use Cantor's logic on this table and see if we can construct*
*>a number which is not in the table. We take the numbers from the*
*>diagonal, and construct the number ...111111 just like we did above.*

Not only is '...111111' not a number, it isn't a decimal representation of a number. So you haven't proved anything except your lack of understanding.

*>Ok, so if Cantor was wrong,*

He wasn't.

*>The answer is one already well known to mathematicians.*

Alas, yes ;−)

*>They just never realized how it applied here.*

Would that were so. You're not the first to confuse a string of digits with a number.

*>"infinity" is only a name for something which can not exist.*

An interesting claim. What is the largest integer? What do you get
when you add one to it?

*>The contradiction that Cantor put into his assumptions in the*
*>diagonal proof, was that something of infinite size does exist.*

He made no such assumption.

*>The number I call D,*

There is no such number.

*>he declares does it exist.*

No.

*>If you think it's ok to use infinity like it was real, it becomes*
*>possible to prove anything by contradiction.*

No.

*>I can easily for example prove that 1= 0 by making the same mistake*
*>by playing with an infinit series of 1 − 1 + 1 − 1 + 1 ...,*

No. That is not a convergent series.

*>or by using 1/0 in a proof as if it were a number that*
*>existed.*

The issue there is more subtle; by definition 1/0 is undefined, since
there is no x such that x*0=1. One could, of course, extend the reals
in such a way as to allow it to be defined, but only by sacrificing
one or more of the expected properties of the arithmetic operations.
The fallacies that you have seen were the result of simultaneously
assuming that 1/0 was defined and assuming that the normal properties
of the arithmetic operations still applied.

*>So, what I'm saying is that infinite sized sets don't exist at all,*
*>and can't exist.*

You're free to say it. You'll need to do more than just say it if you
want Mathematicians to take you seriously.

*>And any time you start with an axiom which says "infinite sized sets*
*>do exist", you have introduced an contradiction into your axioms*
*>which guaranties contradictions in your results.*

You have failed to demonstrate such a contradiction. You're not
exactly plowing new ground here.

*>We don't have "the set of all integers". What we have is a counting*
*>algorithm that can generate as many integers as you need for any*
*>application.*

No, what we have here is a formal system, not an algorithm.

*>It's perfectly valid to talk about what infinite algorithms do as*
*>they approach infinity.*

What do you mean by "approach infinity"?

*>But once you start to pretend they reach it*

What do you mean by "reach it"? Why are you pretending that anybody pretends whatever it is that you mean?

*>and a world which has nothing to do with the universe we exist in.*

An interesting claim, one that you have failed to justify.

*>This is because "ideas" are not "magic".*

You seem to belive that they are, because you are applying nonlogical processes in order to sell your ideas.

*>They are the result of mechanical computation.*

I see that it is not only the Mathematicians who are not psychologists. To the best of our knowledge and understanding, mental processes are electrochemical, not mechanical. Of course, proofs are not ideas, so you are even further off base.

*>So any time you talk about computing an infinite sized set*

You are the only one that has talked about such a computation. The Cantor diagonalization is not a computation.

*>fantasy world*

The only fantasy world involved is the one in which people have written the things that you imagine they have written.

*>If you start an algorithm*

The proof does not involve an algorithm.

*>And as I showed above,*

You showed nothing except your misunderstanding of what an integer is.

*>If you "pretend" the job of construction does end*

Why are you pretending that there is a "job of construction"?

*>Much other important work, such as G÷del's, also fell prey to this*
*>same mistake.*

There is no G÷del; there is only Gödel; your news client is broken.
And you have failed to identify any mistake made by Gödel.

*>Oh, and if you want a mapping from the integers to all the reals,*
*>here's one:*

No. Again you are confusing an integer with a string of digits.

*>So your integer which grew to infinity in one direction*

Integers don't grow to infinity. They just are.

*>Now, I know most (if not all of you), will tell me I'm crazy.*

More like confused and ignorant.

*>How is my proof*

You had no proof.

*>any less valid*

Because you manipulated terms that you didn't understand in a fashion
that had nothing to do with logic.

*>If you can't tell me that,*

We can, and have, told you that. We can't make you overcome your
preconceptions.

*>Has any one else put forth this same argument (or others) that*
*>Cantor's proof is invalid?*

The world is and was full of people who deluded themselves into
believing that they had proofs of all sorts of things.

[1] Using only protractors and straightedges, of course.

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Shmuel (Seymour J.) Metz, SysProg and JOAT  <http://patriot.net/~shmuel>
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right to publicly post or ridicule any abusive E-mail.  Reply to
domain Patriot dot net user shmuel+news to contact me.  Do not
reply to spamtrap@library.lspace.org