Re: Cardinality of Real Numbers

Source: http://sci.tech−archive.net/Archive/sci.math/2005−09/msg00365.html

- *From*: Martin Shobe <mshobe@xxxxxxxxxxxx>
- *Date*: Fri, 02 Sep 2005 11:50:58 GMT

On Thu, 01 Sep 2005 23:39:16 −0600, Virgil
<ITSnetNOTcom#virgil@xxxxxxxxxx> wrote:

>In article <u7lfh19ci265649u3nurks2u3b1281csc6@xxxxxxx>,
> Martin Shobe <mshobe@xxxxxxxxxxxx> wrote:
>
>> >What do you mean: "Cantor's first requires the well−ordering be
>> >order−equivalent to N?" Do you mean that to say that Cantor's first
>> >applies to a bijection from N to R only, or what?
>>
>> Yes. Cantor's first assumes the existance of a bijection between the
>> natural numbers and the reals. From this, a contradiction is reached
>> by showing that there must be a real mapped to a natural number that
>> is also mapped to a number larger than any natural number.
>
>As I read it, Cantor's first starts with an arbitrary injection from the
>naturals to the reals, and shows that there is some real not in the
>image of that injection. Thus no such injection can be a surjection. No
>contradiction required.
>
>Many mathematicians, and I believe Cantor was one of them, did not much
>like proofs by contradiction, and go to considerable lengths to avoid
>them where possible. In this case no great lengths were required.

This is where I got Cantor's first proof from

http://en.wikipedia.org/wiki/Cantor%27s_first_uncountability_proof

In this article, the proof is a proof by contradiction. As I don't
have access to the originals, I can't tell you if that was actually
Cantor's proof.

Martin
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- ***Follow−Ups***:
  - ♦ ***Re: Cardinality of Real Numbers***

- ◊ *From:* Virgil
- ♦ ***Re: Cardinality of Real Numbers***
  - ◊ *From:* Randy Poe

- ***References***:
  - ♦ ***Re: Cardinality of Real Numbers***
    - ◊ *From:* Ross A. Finlayson
  - ♦ ***Re: Cardinality of Real Numbers***
    - ◊ *From:* Martin Shobe
  - ♦ ***Re: Cardinality of Real Numbers***
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    - ◊ *From:* Martin Shobe
  - ♦ ***Re: Cardinality of Real Numbers***
    - ◊ *From:* Virgil

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