Re: Cardinality of Real Numbers

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- *From*: Virgil <ITSnetNOTcom#virgil@xxxxxxxxxxx>
- *Date*: Thu, 01 Sep 2005 23:39:16 −0600

In article <u7lfh19ci265649u3nurks2u3b1281csc6@xxxxxxx>,
Martin Shobe <mshobe@xxxxxxxxxxxxx> 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.
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    - ◊ *From:* Martin Shobe

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