Re: Multiple infinities − one more look

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- *From*: Venkat Reddy <vreddyp@xxxxxxxxx>
- *Date*: Fri, 7 Dec 2007 21:59:17 −0800 (PST)

On Dec 8, 8:33 am, "Mike Terry"
<news.dead.person.sto...@xxxxxxxxxxxxxxxxxxx> wrote:

> "Venkat Reddy" <vred...@xxxxxxxxx> wrote in message
>
> news:052a8b26−92db−46a9−8caf−1ba9c7300927@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
>
>> I see. I think order is related to how you choose to represent the
>> number. If the real number is represented by a digit sequence of
>> infinite length, we immediately have an order for all reals, since
>> digit position have an order. For example, for the length of 6 digits,
>> one can generate these sequences by writing all possible permutations
>> and combinations of digit sequences in an orderly fashion. This can be
>> continued for lager length of digit sequences without limit. All
>> possible digit sequences are guaranteed to appear somewhere in the
>> list.
>
> No. This process only generates finite digit sequences. Real numbers have
> infinite digit sequences...
>
>> Instead, if you choose to represent a real number by an algebraic
>> equation, here also we have an order in representing the equation
>> itself, so the resulting reals have an order. Likewise for
>> transcendental as well − once you have a way of identifying the
>> number, we have a way of ordering them.
>
> It seems you are thinking of something like "computable numbers", and these
> are indeed countable. Real numbers need not be computable in this sense
> (i.e. having a finite program to output their digits in sequence).

You may say you want to represent the real number as a point on the line such as the interval [0,1]. Here also we have an order. Cut the line into half and mark the 0.5 as your first real number. Cut the two pieces in to two equal parts, mark 0.25 and 0.75 as new real numbers. Continue the process for ever and you have a