

Re: New countable infinity logic

Source: <http://sci.tech-archive.net/Archive/sci.math/2004-12/0710.html>

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Date: 11/22/04

Date: Mon, 22 Nov 2004 13:37:08 -0500

In <b453b903.0411201056.503ff334@posting.google.com>, on 11/20/2004 at 10:56 AM, whit0911@umn.edu said:

>Is the infinite set "Dec3" = { 0.3, 0.33, 0.333, ... } equivalent to
>the infinite set "Dec3&1/3" = { 0.3, 0.33, ..., 0.333... } = {0.3,
>0.33, 0.333, ..., 1/3}? Alternatively, does Dec3 contain 1/3 as an
>element?

No and no.

>If not, how can Dec3 be an infinite set?

Take Dec33={0.33, .0333, ...}. Dec33 is a subset of Dec3, and can be put into a 1-1 correspondence with it with the function S: 0.3(n)→0.3(n-1), where 0.3(n) is $\sum_{i=1}^n 3^{-i}$. Hence D3 is infinite.

>For the set Dec3 to contain 1/3,

It would have to have a different definition from the one that you gave it.

>may or may not apply to any infinite natural numbers if they exist.

They don't exist, by definition. Now, you are always free to define a system that includes the naturals, but it's up to you to stipulate what the system is, what its properties are, etc. It's not enough to just coin a term, you must characterize the referent.

> "A fundamental property of the integers" (knowledge of fundamental
>property based on positive integers only) "is that when the number 2
>is added to any integer," (positive assumed again) "the absolute
>value is 2 units greater than the integer".

That makes no sense, because your use of "absolute value" implies that you are dealing with signed numbers. We can define signed integers in terms of unsigned integers in a fashion that preserves the commutative and distributive properties and that retains a slightly modified form

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of the order properties; you have yet to do so for extended integers.

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