

Re: .999... ?= 1

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In article <40C5F9DD.8070703@et.uni-magdeburg.de> Eckard Blumschein <blumschein@et.uni-magdeburg.de> writes:

> *Robin Chapman wrote:*

> > *Your handling of zero is ceertinly uncertain.*

> >

> > *Is "infinity" actually a number?*

>

> *I know that there is seemingly no need for treating it like a number*

> *while this status is commonly attributed to its reciprocal.*

Depends on what you define as a number (I have not seen a definition in this thread yet), and how you define inverse/reciprocal. Commonly in the definition-process, there are only two starting operations: addition and multiplication, and how they hang together in a ring.

At some point the reciprocal of a number a is defined as the number ra such that $a * ra = 1$ (the unity of the multiplication). It is only after that that division is defined as a shorthand for multiplication by the reciprocal. Similarly, negative numbers are defined as numbers that add up to the original, such that their sum is 0 (the unity of the addition). Only after that subtraction is defined.

Now let's see how that works in a ring where 0 (the unity of the addition) has an inverse, say ∞ . So $1/0 = \infty$ and $0.\infty = 1$. Now what is $2/0$?

If it is also ∞ , we have:

1. $\infty + \infty = 1/0 + 1/0 = 2/0 = \infty$ (using the distributive property)

2. $\infty + \infty = \infty \rightarrow \infty = 0$ (using the property of the additive inverse)

So that will not work. We need more infinities to make it work.

(Unless you throw away one of the two properties used above.)

But the strange thing is, it does not matter how many infinities we add, we can not get something consistent (David Cantrell argues otherwise, yes, I know).

> *I vaguely*

> *recall: Only a few experts do not consider zero a number. Is this correct?*

Not as far as I know, I have never met an expert who did consider 0 not a number.

sci.math: Re: .999... ?= 1

> *Do not object against zero as the reciprocal. I know.*

See above.

> > *Bravo! You might like to read up on the "balanced ternary"*

> > *number system :-)*

>

> *Is it of any importance?*

Yup, it is, for your arguments. Some of them fall flat on their face when you use balanced ternary rather than decimal.

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