

Re: Contradiction-free mathematics (The new nonstandard analysis)

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 - *Date:* Tue, 31 Jan 2006 16:39:42 EST
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You haven't given nearly enough detail for anyone to find a contradiction.* Please:

1. List your axioms explicitly. Start with a list of the undefined notions, then give a formal statement of each of the axioms.

The three axioms are all listed in my first post of Jan. 5. At any rate, here are the axioms of the new real number system R^* , $+$, \times .

- 1) R^* contains the basic integers 0, 1, . . . , 9.
- 2) The addition table
- 3) The multiplication table.

The elements of R^* are decimals and the addition and multiplication tables specify our present way of adding and multiplying decimals. The decimals are built entirely on the basic integers. There are no undefined concepts or terms because such concepts are ambiguous and source of contradictions. A concept simply means symbol, term, notion, etc. Every concept is well-defined. A concept is well-defined if its EXISTENCE, properties and relationship with other concepts are specified by the axioms. I stress existence to avoid vacuous concept or proposition which is ambiguous and source of contradiction. To be well-defined I set additional requirement a new real number to be well-defined: every digit is known or computable.

Computable is used in a broad sense: that there is some rule or algorithm or scheme for determining every digit. Thus the irrational pi is well-defined because every digit can be computed from its series expansion.

2. Say exactly what criteria you require to show that something which is not an axiom is provable from your axioms.

Proofs rely entirely on those axioms.

* Here is an example. You define your real numbers to be the completion of a certain initial set.

No, I did not say this at all.

You claim that the sequence 1, 0.1, 0.001, 0.0001 does not converge to 0. But in the ordinary sense of the word

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completion that sequence certainly converges to 0. You do not define what you mean by "completion" and so it is impossible to show that you are wrong. But that isn't because you are correct, it is only because you have failed to define what you mean by completion. In every previous constructive analysis (such as Bishop, Brouwer, etc.,) the sequence above is believed to converge to 0.

I never use ill-defined concepts and never use completion, convergence as they are not well-defined in this mathematical space. So your statement above are not valid. A nonterminating decimal is a standard Cauchy sequence in which every term is known or computable. The sequence 0.1, 0.01, 0.001, . . . is the nonstandard Cauchy sequence of the nonstandard number d^* which is well-defined as $1 - 0.99 . . .$

At any rate everything is explained by my posts (several of them now) and my responses to messages.

Cheers.

E. E. Escultura

• **References:**

- ◆ **[Re: Contradiction-free mathematics \(The new nonstandard analysis\)](#)**
◇ From: matthias

- Prev by Date: **[Re: Cantorian pseudomathematics](#)**
- Next by Date: **[Re: Cantorian pseudomathematics](#)**
- Previous by thread: **[Re: Contradiction-free mathematics \(The new nonstandard analysis\)](#)**
- Next by thread: **[Re: Contradiction-free mathematics \(The new nonstandard analysis\)](#)**
- Index(es):
 - ◆ **[Date](#)**
 - ◆ **[Thread](#)**