

Re: Cantorian pseudomathematics

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Han.deBruijn@xxxxxxxxxxxxxxx wrote:

Han.deBru...@xxxxxxxxxxxxxxx wrote:

Our goal is to establish, though, that "materialization" may be more than just a hollow phrase and it's covering more than some well known habits of our scientists and engineers.

Here is our basic picture again. Post- instead of pre-processing:

```
materialization
mathematics =====> real world
```

Let's start with the real numbers as an appetizer. The obvious question is: what is the materialization of the real numbers, in the real world? When looking for an answer, you are not free to grab something out of the big blue sky. You should look instead to that real world itself and ask yourself what is the most significant & outstanding materialization of the real numbers. As i.e. David Petry has said on many occasions, it is beyond doubt that the answer is found in: our computing devices. I'm not going to call this an axiom, because it would suggest something we are not going to do here: abstract mathematics. Instead, I would like to call it something that is "essential". And no, it doesn't mean that there are no other possibilities, like continued fractions or some such. It only means that mainstream materialization is adopted as significant enough for our purpose.

Essential 1

The (best / most common) materialization of the real numbers is the

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makes `_science_` out of your mathematics. Right?

Still no. *Your* materialization is strange: floating point numbers are very far from ideal, mainstream reals. And you dismiss all mathematics history before computers, and those many interpretations and/or constructions of real numbers. Difficult to accept, unless you show a very good reason for that. What is it ?

Considering again the above example, this means that the isolated point $x=1$ in $f(x)=(x^2-1)/(x-1)$ can be defined in `_mathematics_` as $f(1) = 1$, but it can `_not_` be defined in `_science_` as $f(1) = 1$. In science, the outcome can only be $f(1) = 2$, being the same as the limit value there.

Excercises:

- How about the distinction between rational and irrational numbers? Is it scientific or purely mathematical?

Guess. Hint: draw a square of side 1. Is it true that no rational number is the length of the diagonal. Is it mathematical or scientific ? Maybe you mean that in practice, no square is perfectly square, and no length is perfectly measured. Right, but then you don't do mathematics anymore. Worse, I doubt you'll find something interesting to study.

- How about the scientific meaning of a function that assigns value 0 to any rational number and value 1 to any irrational number in $[0,1]$?

This one is more tricky ;-) Although it's not conceptually very difficult to accept, I admit it's not often useful in practical computations - though the theories behind *are* useful.

Remember: Een vos verliest wel zijn haren, maar niet zijn streken :-)

Can you translate, please ? I tried automatic translation from dutch on a website, it was rather surrealistic :-)

Han de Bruijn