Re: abundance of irrationals!)

Source: http://sci.tech−archive.net/Archive/sci.math/2005−05/msg02370.html

- *From*: Tony Orlow (aeo6) <aeo6@xxxxxxxxxxx>
- *Date*: Thu, 12 May 2005 11:10:50 −0400

Russell said:
> I already responded once to this, but seems that the
> Google dog ate it. Second try.
>
> Tony Orlow (aeo6) wrote:
> > Russell said:
> > > aeo6 Tony Orlow wrote:
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> > > > > > Russell said:
> > > > > > > aeo6 Tony Orlow wrote:
> > > > > > > >
> > > > > > > > [snip]
> > > > > > > >
> > > > > > > > Excuse me, but the nodes of an infinitely deep binary
> tree
> > > can
> > > > > > > > obviously be
> > > > > > > > enumerated in a linear manner, corresponding to binary
> > > integers
> > > > > > > > and
> > > > > > > > thus to the
> > > > > > > > naturals.
> > > > > > > >
> > > > > > > > Yes.
> > > > > > > >
> > > > > > > > If you want to complain that it would require infinite
> digits
> > > for
> > > > > > > > most values,
> > > > > > > >
> > > > > > > > Huh? What does that even mean? What values are you
> > > > > > > > talking about? And digits of what?
> > > > > > > > Duh. The digits of the binary number that represent each node
> on
> > > the
> > > > > > > tree,
> > > > > > >
> > > > > > > Ok; if that's what you mean, then each node on the tree

> > > > > is represented by a *finite* sequence of digits.
> > > > The tree has infinitely long branches, so no, you're wrong.
> > >
> > > Well, this is the essence of our disagreement, and if
> > > we can't get this basic thing cleared up then there's no
> > > point in my going further with the discussion.
> > Did you say it was an infinitely deep binary tree or not? What did
> that mean?
> > Is 2^oo finite? Come on.
>
> I didn't disagree that the branches (or paths, as I
> called them) are infinitely long. Our disagreement
> is this: you think this invalidates my earlier claim
> (that each node in the tree is represented by a finite
> path) and I do not.
if a branch is infinitely long, how long is the string of bits that specifies
the node at the end (or finitely close to the end) of that branch? If the node
is infinitely far down a branch, it requires infinite bits, one for each fork.
>
> I hope you can see that this is just the same old
> disagreement in disguise, to wit, my claim that the
> naturals are all finite (which you dispute) despite
> the fact (which we agree on) that the set of all
> naturals is infinite. To see the correspondence,
> we of course only have to count along the nodes on
> some infinite path of our choice −− each node along
> the way gets a (finite!) number assigned to it by
> this counting process. I claim we can walk along
> and step on *all* of the nodes without ever stepping
> on one that gets an infinite number assigned to it.
> (Of course it would take forever, so I don't mean
> this literally.) This is what you dispute.
Yes, it's illogical to believe this. I can't emphasize this strongly enough.
You want to tell me you can walk an infinite number of constant finite steps in
a straight line, and still be a finite distance from your starting point. I
say, learn real math. That's impossible. If your axioms tells you this, rethink
them. That's allowed. Really it is, and it's to be encouraged. God did not hand
us a tablet of axioms. We make them up. We are human. We are fallible. But we
can evolve and change. That is what being alive is all about. Are you so old a
dog you can't learn new tricks?
>
> Without criticising your belief, which I admit at
> first glance seems no more mind−boggling than what
> I have said, indeed probably less so, I would ask
> you to approach the question logically, and examine
> what are the logical consequences of your belief
> vs. mine. Others have tried to lead you down this
> path, and I don't think I can do this any better
> than they have. So I will defer to them, and limit
> my remaining remarks to a critique of your proof
> below. I hope my position makes a little more sense

> to you now, even if you still disagree with it.
Well, I feel pretty resolved in my position, by allowing that the set of naturals is infinite, and therefore requires infinitely long strings of symbols to enumerate the elements, just like every other infinite set that exists, including the reals and rationals. Suddenly, they all share similarities based on this common property, based on rules of information science. I understand that the method I put forth for measuring both finite and infinite sets by their fucntions that produce their members from the naturals only works for sets that are defined by invertible functions, but this is a broad spectrum of sets that were previously just lumped together without distinction. I think it's progress.
>
> > >
> > > Now, I haven't been following this thread, so I don't
> > > know what your position is on the following question: Do
> > > you believe there is some natural number with infinitely
> > > many digits? If you don't, then there is some hope, but
> > > otherwise, i.e. if you do, I think I will bow out as there
> > > cannot be anything for me to add to the discussion that has
> > > not already been said.
> > You are new. I have proven that you cannot have an infinite set of
> natural
> > numbers which are all finite, based on infinite series
> (1+1+1+....=oo) and
> > based on infomation science (S^L is the number of strings of length L
> made of S
> > different symbols, one of which must be infinite for infinite sets of
>
> > representations). It is patently impossbile to squeeze an infinite
> number of
> > numbers with a finite difference between the values of each pair of
> them, into
> > a finite range of values. Therefore, if the set of naturals is
> infinite, then
> > it must clearly contain infinite values, which must be infinite
> strings of
> > digits, given the defintion of the digital number system.
>
> I followed this with nodding assent all the way down to
> the word "therefore"; but at that point I saw nothing
> in what had preceded it to justify this word. All you
> did, up to that point, was show (really, assert −− but
> let that pass) the infinitude of the naturals. That
> wasn't in dispute. Your sentence beginning "therefore"
> puts the result of your previous reasoning into an "if"
> clause and asserts that which was to be proved (the crux
> of it, anyway) in the "then" clause −− but you don't tell
> us anything at all to justify this if−then pairing. You
> say "clearly", and that does convey your strength of
> conviction that this disputed conditional stmt actually
> holds −− but for us doubters, the word "clearly" by itself

> is not adequate justification. Sorry, not a proof.
So, you assert that S (number of symbols=digital number base) is finite, and L (length of string=# digits) is finite, but S^L (the size of the set of strings of length L constructed from a set of symbols of size S) is infinite? Under what circumstances can S^L be infinite?
>
> But doubtless I am not the first to say so, and this
> brings me to my final remarks.
>
> >
> > You probably don't have anything to add, if that's what you think is
> the case.
>
> I hope I've provided some useful things, to you or to
> others who might be reading. In any case I must now let
> my words stand as they are, without further comment.
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>

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Smiles,

Tony
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- ***Follow−Ups***:
  - ♦ ***Re: abundance of irrationals!)***
    - ◊ *From:* Russell
  - ♦ ***Re: abundance of irrationals!)***
    - ◊ *From:* Virgil

- ***References***:
  - ♦ ***Re: abundance of irrationals!)***
    - ◊ *From:* Randy Poe
  - ♦ ***Re: abundance of irrationals!)***
    - ◊ *From:* mueckenh
  - ♦ ***Re: abundance of irrationals!)***
    - ◊ *From:* Virgil
  - ♦ ***Re: abundance of irrationals!)***
    - ◊ *From:* mueckenh
  - ♦ ***Re: abundance of irrationals!)***
    - ◊ *From:* Randy Poe
  - ♦ ***Re: abundance of irrationals!)***
    - ◊ *From:* mueckenh
  - ♦ ***Re: abundance of irrationals!)***
    - ◊ *From:* Randy Poe
  - ♦ ***Re: abundance of irrationals!)***
    - ◊ *From:* aeo6
  - ♦ ***Re: abundance of irrationals!)***

- ◊ *From:* Russell
- ♦ ***Re: abundance of irrationals!)***
  - ◊ *From:* aeo6
- ♦ ***Re: abundance of irrationals!)***
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  - ◊ *From:* aeo6
- ♦ ***Re: abundance of irrationals!)***
  - ◊ *From:* Russell
- ♦ ***Re: abundance of irrationals!)***
  - ◊ *From:* aeo6

- Prev by Date: ***Re: question regarding convergence of series***
- Next by Date: ***Re: abundance of irrationals!)***
- Previous by thread: ***Re: abundance of irrationals!)***
- Next by thread: ***Re: abundance of irrationals!)***
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