Re: infinity

Source: http://sci.tech−archive.net/Archive/sci.math/2005−10/msg01985.html

- *From*: "Randy Poe" <poespam−trap@xxxxxxxxx>
- *Date*: 18 Oct 2005 18:42:06 −0700

Tony Orlow wrote:
> Randy Poe said:
> >
> > Tony Orlow wrote:
> > > Virgil said:
> > > > Except that Card(P(N)) = Card(R) has been proved to hold outside of
> > > > TOmatics.
> > > Only according to axioms that basically state this fact with no justification.
> >
> > It's a theorem. That means it comes with a proof.
> Based on axioms that don't come with a proof.
> >
> > > There is no justification for any such statement. If you disagree, please
> > > explain exactly why this is so.
> >
> > 1. The meaning of "Card(A) = Card(B)" is defined as "there exists
> > a bijection between A and B."
> So Card(*N)=Card(P(*N)). Loverly!

No, there is provably no bijection between A and P(A)
for any set.

The meaning of "Card(*N) = Card(P(*N))" would be "there exists
a bijection between *N and P(*N)." Since there does not, you
can not draw that conclusion.

> > 2. A bijection between P(N) and R can be shown to exist.
> Through the infinite binary strings, I know.

Then why did you ask?

> Of course, how do you know, as
> Dave Tribble says, that there are enough bits in the elements of P(N) compared
> to the other infinity of bits in the elements of R?

No such vague statements as "other infinity of bits" are
needed. Just consider bit strings consisting of one bit in each
position n where n is a natural number.

It is provable (not an axiom) that every real number in [0,1)
corresponds to such a bit string, and every such bit string
corresponds to a real number. There is a bijection between those
PARTICULAR infinite bit strings and the numbers in [0,1).

What do you think is missing there?

> > 3. Therefore Card(P(N)) = Card(R)
> Maybe as far as cardinality goes. in reality, the two sets are not of equal
> size.

Well "as far as cardinality goes" would be what we mean when we
say the cardinalities are equal. Do you think that equal cardinality
has to do with something else other than cardinality?

> > In our axiomatic system, #1 is the meaning of "equal cardinality"
> > and #2 is the proof.
> The same objection

What objection?

> can be applied to the bijection between R and P(N) as
> between *N and P(*N).

There is a simple proof that any such bijection is impossible.
That proof does not apply to R and P(N). Your "objection" is an
objection on vague grounds to a wishy−washy statement that you
might try to raise in your own parody of the proof, but is not
an objection to a statement that occurs in the actual proof.

− Randy

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- ***Follow−Ups***:
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    - *From:* Ross A. Finlayson
- ***References***:
  - ***Re: infinity***
    - *From:* Daryl McCullough
  - ***Re: infinity***
    - *From:* Daryl McCullough
  - ***Re: infinity***
    - *From:* Tony Orlow
  - ***Re: infinity***
    - *From:* David R Tribble
  - ***Re: infinity***

- ◊ *From:* David R Tribble
- ♦ ***Re: infinity***
  - ◊ *From:* Tony Orlow
- ♦ ***Re: infinity***
  - ◊ *From:* Tony Orlow
- ♦ ***Re: infinity***
  - ◊ *From:* Randy Poe

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