Re: infinity

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* *From*: Tony Orlow (aeo6) <aeo6@xxxxxxxxxxx>
* *Date*: Wed, 24 Aug 2005 10:47:32 −0400

David R Tribble said:
> David R Tribble said:
> >> Or perhaps I'm confused and you previously stated that points have
> >> widths larger than zero? If so, how wide is a point (the whole
> >> kind, not the infinitesimal kind)?
> >
> Tony Orlow (aeo6) wrote:
> > If you ask most people what infinity times zero is, they answer zero.
>
> Most people, fortunately, are not mathematicians. If you ask a real
> mathematician, he'll say it's undefined. That value comes up a lot
> when dealing with limits, and several different meanings can be
> attached to it.
Yes, I understand that. The answer can be zero or infinity, or any finite
number, depending on the zero and infinity you started with. I am talking about
intuitions here, and the idea that one can have an infinite number of
infinitesimals which are points that are indistinguishable on the finite scale.
>
>
> > It seems plenty intuitive for most people to suppose that adding points
> > forever will never make anything larger than a point. So, why does it
> > bother you to imagine such a thing?
>
> I've never had a problem accepting that points have zero width.
> And yet if you combine enough of these zero−width points, you
> get a segment of the real number line, or perhaps the entire real
> number line, either of which obviously has a width greater than
> zero. I see no conflict here.
Neither do I. Of course, you need an infinite number of points to fill any
finite space. Zero times infinity CAN be a finite or infinite product.
>
> Given any two points, which both have zero width, their combined
> width is still zero, of course. Add in all the points that exist
> between these two points, and you get a line segment with a width
> greater than zero. I see no conflict here, either. If a line
> segment with a non−zero length is not composed of the zero−width
> points contained in it, what else is it composed of?
That seems to be a problem for some. I know Lester and Albert in
comp.ai.philosophy were arguing about points and lines some time ago. In a

sense, I think it helps to think of the points as endpoints of infinitesimal line segments, but that's not necessary, if adding zeroes to get finite values doesn't bother you.

>
> You're saying that no number of zero−width points, not even an
> infinite number of them, can add up to anything greater than zero.

No, maybe I wasn't clear. I am just saying that one CAn have multiple points in essentially the same place that are distinct.

> Yet you also claim that the infinite set of naturals is mappable
> to the set of points in [0,1). So is the size of [0,1) zero?
> Is the sum of the widths of all the points in [0,1) just zero?

No, that is not what I mean at all. By the way, I am going to have to backpedal on the statement that there is the same number of points in [0,1) as whole numbers, since it causes a contradiction. If we say there are N points in each unit on the number line, then there are N^2 points in the entire real line, since there are N units total. However, there must be more than N^2 points in the real line, since there are N^2 points in the set defined by f(n)=sqrt(n) for n in N, which is a sparse set in the reals. So, the entire set of reals must contain more than N^2 points. Now I am back to my original position that the real, continuous infinity is, as Cantor acknowledged, an entirely different level of infinity from the discrete "countable" infinities, and cannot be mapped by any finite formula from the naturals. The only mapping that would populate the real line using a function on the naturals would be log(log(log (.....(n)))).... The confusion comes from equating digital number systems with real numbers, when they are actually a form of symbolic language that is USED to represent quantities. Of course, Cantor suffered from the same confusion when he provided the diagonal argument concerning the uncountability of the reals. I hope my retraction makes everyone happy. :D

>
>
> > Points are zero in size, but just as there are many levels of
> > infinity, therre ar equally many levels of zero. Zero and infinity are two
> > sides of the same coin.
>
> So in addition to having many different natural infinities, now
> you're saying that there are an infinite number of zeros? Do you
> have to add yet more axioms to Peano's in order to account for them?
> If I get an answer of zero from some arithmetic or set operation,
> how do I know which zero it is?

If you are working on a finite scale it doesn't matter, but if you care, you have to use methods similar to those used to discern infinities. Certainly, 1/oo is half of 2/oo, given the same infinity. It's interesting to think about.

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Smiles,

Tony
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    - ***Re: infinity***
        - *From:* Jesse F. Hughes
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