

Re: infinity

Source: <http://sci.tech--archive.net/Archive/sci.math/2005-09/msg01342.html>

- *From:* "William Hughes" <wpihughes@xxxxxxxxxxxx>
 - *Date:* 6 Sep 2005 18:24:41 -0700
-

Tony Orlow (aeo6) wrote:

> William Hughes said:

>>

>> Tony Orlow (aeo6) wrote:

>>> William Hughes said:

>>>>

>>>> stephen@xxxxxxxxxxxx wrote:

>>>>> William Hughes <wpihughes@xxxxxxxxxxxx> wrote:

>>>>>> Tony Orlow (aeo6) wrote:

>>>>>>> No, it's really not. This problem is couched as an infinity problem. The
>>>>>>> infinite set of natural numbers requires infinite values. Cantorian thought
>>>>>>> purports to talk about infinity, but then limits itself to finite numbers so as
>>>>>>> to avoid the topic. I said IF you limit yourself to finite numbers, THEN you
>>>>>>> could have an empty vase at noon, although this answer still makes no sense
>>>>>>> given the constantly increasing sum. This is one of the reasons NOT to limit
>>>>>>> the naturals to finite values. There is no well-defined size of this set,
>>>>>>> despite the fact that it must be finite, logically.

>>>>>>

>>>>>>> I assumed, wrongly, that you accepted the existence of the
>>>>>>> finite integers. Your contention that "it [the size of this
>>>>>>> set] must be finite, logically", is one of your strangest and
>>>>>>> silliest. Why can't there be an infinite set of finite things?
>>>>>>> Does the fact that we have an infinite number of ping pong
>>>>>>> balls mean some of them must be of infinite size?. Yes, assuming
>>>>>>> that there are a finite number of finite integers leads to a
>>>>>>> contradiction, as there are clearly an infinite number of them.

>>>>>>

>>>>>>> Tony refuses to precisely define what he means by 'infinite'
>>>>>>> or 'finite'. Apparently the set of finite integers is finite,
>>>>>>> or perhaps it is undefined. I think Tony's math allows a set
>>>>>>> to be neither finite or infinite.

>>>>>>

>>>>>>> Clearly the number of finite integers cannot be a finite
>>>>>>> integer. Let F be the number of finite integers.
>>>>>>> Tony agrees that if F is a finite integer, then $F+1$ is
>>>>>>> a finite integer. That means that the set $\{1, 2, 3 \dots F, F+1\}$
>>>>>>> contains $F+1$ finite integers, which contradicts the claim
>>>>>>> that there were F finite integers.

Re: infinity

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>>>>
>>>> This uses the fact that a finite set must have a largest element.
>>>> TO (at least implicitly) does not accept this. According
>>>> to TO
>>>>
>>>> -the set of finite integers contains a finite
>>>> number of elements
>>>>
>>>> -there is no largest finite integer
>>>>
>>>> TO appears bothered by this contradiction, his conclusion is that
>>>> the set of finite integers doesn't exist!
>>>>
>>>>> Perhaps in Tonymatics a set can still be finite even
>>>>> if the number of the elements in the set is not finite.
>>>>>
>>>>>
>>>>> Consistency is not TO's strong suit.
>>>>>
>>>>> -William Hughes
>>>>>
>>>>>
>>>> The only contradiction arises from your obsession with a last element, and
>>>> conflation of it with finiteness for a set. I do not accept that a last element
>>>> necessarily indicates a finite set, therefore I see no contradiction between
>>>> the set of finite naturals being finite and not having a last element.
>>>>
>>>> As stated above I realize you believe that there are only a finite
>>>> number of finite integers, and there is no largest finite integer.
>>>> You avoid an explicit contradiction only by refusing to define what
>>>> you mean by infinite. When I said that "TO appears bothered by this
>>>> contradiction" I was referring to your statment "There is no
>>>> well-defined size of this set [the finite integers]
>>>> despite the fact that it must be finite, logically."
>>>>
>>>> -William Hughes
>>>>
>>>>
>>>> Why should a poorly defined set size necessarily be infinite? What is the
>>>> contradiction between saying the size is not well defined, although it is known
>>>> to be finite? The number of printed words on Earth is also known to be finite,
>>>> though not a well defined number, and without any upper bound.
>>>>
>>>> When I say a number is infinite, one definition might be to say that counting
>>>> to it, using a constant finite unit of time per iteration, would take forever.
>>>> I am not sure how to defined it to your satisfaction, but I think we all know
>>>> what we are talking about. A finite number is one we could count to, and an
>>>> infinite number is greater than any finite number.

This is not quite what we need. We need a way to tell if a set has

Re: infinity

a finite or infinite number of elements. We might use something like "if we remove one element using a constant finite unit of time per iteration,

we will always exhaust a set with a finite number of elements, but never exhaust a set with an infinite number of elements".

Unfortunately, this leads immediately to the observation that any set of integers with a finite number of elements has a largest element (just take any integer from the set, then take the rest one by one, always keeping the largest found so far. If the set has a finite number

of elements this process must terminate. When it does you have your largest element). So with this definition either:

–there are an infinite number of finite integers

or

–there is a largest finite integer

> I think we agree that if x

> and y are finite, then $x+y$, $x*y$, x^y are all finite.

The trouble is that " x,y finite implies $x+y$ finite" leads immediately to the fact that the sum of a finite number of integers is finite.

So:

Let K be the set of finite integers. Assume K has a finite number of elements. Let n be the sum of all the elements of K . Then n is a finite integer. But n is not an element of K . Contradiction.

Therefore K has an infinite number of elements [1]

–William Hughes

[1] this specific argument was presented by Daryl McCullough

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• *Follow-Ups:*

◆ *Re: infinity*

◇ *From:* aeo6

• *References:*

◆ *Re: infinity*

◇ *From:* William Hughes

◆ *Re: infinity*

◇ *From:* aeo6

• Prev by Date: *Finite Field*

Re: infinity

- Next by Date: ***Re: New and faster algorithm for multiplication***
- Previous by thread: ***Re: infinity***
- Next by thread: ***Re: infinity***
- Index(es):
 - ◆ ***Date***
 - ◆ ***Thread***