

Re: infinity

Source: <http://sci.tech-archive.net/Archive/sci.math/2005-09/msg01798.html>

- *From:* Tony Orlow (aeo6) <aeo6@xxxxxxxxxxxx>
 - *Date:* Thu, 8 Sep 2005 10:10:39 -0400
-

William Hughes said:

>
> Tony Orlow (aeo6) wrote:
>> William Hughes said:
>>>
>>> aeo6 Tony Orlow wrote:
>>>> William Hughes said:
>>>>>
>>>>> 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.

Re: infinity

>>>>>>>>>>
>>>>>>>>>> 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 F, F+1}
>>>>>>>>>> contains F+1 finite integers, which contradicts the claim
>>>>>>>>>> that there were F finite integers.
>>>>>>>>>>
>>>>>>>>>>
>>>>>>>>>> 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 statement "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.
>>>>>>>>>>>

Re: infinity

Re: infinity

>>>>> 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
>>>>> 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

>>>>>

>>>>>

>>>> Yes, I saw it. It's basically the "largest finite" argument.

>>>>

>>>> No it isn't. The difference is that you claim that:

>>>>

>>>> a: the largest finite natural does not exist

>>>>

>>>> b: the sum of all finite naturals does exist but cannot

Re: infinity

>>> be named.

>>>

>>> -William Hughes

>>>

>>>

>> No, I never claimed the sum of all finite naturals "exists".

>

> No I suppose you didn't. You have claimed that:

>

> a: the sum of a finite number of finite integers is finite.

>

> b: there are only a finite number of finite naturals.

>

> I concluded from this that you were claiming that the sum

> of all finite naturals exists. On the other hand I cannot see

> how you can believe a and b and not believe that the sum of all finite

> naturals exists.

Taking the sum of all finite naturals depends on identifying the last of them and completing the sum, but we all know it is impossible to identify any largest finite. The contradiction that is being pointed out now as proof that the set of finite numbers is infinite derives from the contradiction inherent in supposing any largest finite number. So, in this sense, neither the largest finite nor the sum of all finites exist, even though we can say that conceptually they are both finite numbers.

Now, it has been shown that any initial segment of the naturals starting from 1 has as its largest member a number equal to the size of the set. The entire set of finite naturals is the complete initial segment of the set of finite naturals, and so this rule applies throughout it, as it is proven inductively.

So, while admitting that there is no largest finite, standard analysis nevertheless defines one by declaring the size of the set of naturals, which must be its largest member, to be \aleph_0 . Further, standard analysis declares this set size to be infinite based on contradictions derived from the supposition of a largest finite natural, and yet declares that all elements in the set, which would include this supposed infinite set size, to be finite.

>

>>I proved that any

>> set of strings up to a given finite length is finite, and cannot be infinite

>> unless that length is allowed to be infinite. If all strings in your set are

>> finite, then the condition required for the infinite set is not met, and as

>> unbounded as your set may be, it is not infinite.

>>

>

>> The concept of summing all finite naturals rests on the concept of finding an

>> end to the set at which to close the summation.

>

> Maybe, but I am not making this argument. I am merely point out that

> you have claimed that you can sum all the finite naturals (more

> precisely

> that you claim both a and b). Why you believe a and b (whether because

Re: infinity

> of some "end to the set" argument or for some other reason) is
> beside the point. The fact that you believe a and b is not.
If the fact that I believe a and b is important, then you should be interested
in why I believe them. I certainly don't think any sane person would argue
against a) anyway – it's obviously true. So, the question is why I believe that
the set of finite naturals is a finite set. I think the contradiction I pointed
out above, between the infinity of \aleph_0 as a set size and the required
finiteness of it as the largest finite number in the set, points out pretty
clearly that you have a problem here. If the elements are necessarily finite,
then the set cannot possibly have an infinite size, because the size is always
equal to an element in the set.

>
>> So, your argument is a thinly
>> veiled largest-finite argument, no matter how you couch it.

>
> My only claim is that we can use a and b because you have
> claimed them. I did not make any representation as to why
> you claimed them. Apparently you believe:

>
> a: the sum of a finite number of finite integers is finite.
Do you disagree with that statement? It's pretty trivially true.

>
> b: there are only a finite number of finite naturals.
This is almost the root problem here, though it rests on the problem of
misapplying inductive proof.

>
> c: a follows from the fact that there is an end to
> the set of numbers you have to sum
No, this is based on your shared belief, which I do not share, that a finite
ordered set must have a largest member and that not having a largest member
implies infinity. I make a distinction between "infinite" and "unbounded", as
Daryl noted. This assumption, or theorem from set theory, is why Virgil and
others keep accusing me of claiming there is a largest finite, which I have
repeatedly denied. The disagreement is in whether this test is one of infinity,
or simply unboundedness.

>
> d: there is no end the set of finite naturals so
> you cannot sum them

Correct. You cannot specify any sum of the finite naturals any more than you
can specify a largest one of them. However, you CAN prove inductively that the
largest finite is the set size, though we cannot know what that number is, and
you CAN prove that the sum of any finite number of finite terms is finite.
Given that the set of finite naturals is necessarily finite, the sum of that
finite number of finite terms is finite, even though we can never specify it.

>
> Unfortunately, these do not form a consistent set. a and b imply that
> the sum of the finite naturals exists, but d says this sum does
> not exist.

I hope I have explained my thinking to your satisfaction

>

> -William Hughes

>

>

--

Smiles,

Tony

.

• *Follow-Ups:*

- ◆ ***Re: infinity***
◇ *From:* Virgil
- ◆ ***Re: infinity***
◇ *From:* William Hughes
- ◆ ***Re: infinity***
◇ *From:* William Hughes
- ◆ ***Re: infinity***
◇ *From:* Randy Poe

• *References:*

- ◆ ***Re: infinity***
◇ *From:* William Hughes
- ◆ ***Re: infinity***
◇ *From:* aeo6
- ◆ ***Re: infinity***
◇ *From:* William Hughes
- ◆ ***Re: infinity***
◇ *From:* aeo6
- ◆ ***Re: infinity***
◇ *From:* William Hughes
- ◆ ***Re: infinity***
◇ *From:* aeo6
- ◆ ***Re: infinity***
◇ *From:* William Hughes

- Prev by Date: ***Re: infinity***
- Next by Date: ***Re: infinity***
- Previous by thread: ***Re: infinity***
- Next by thread: ***Re: infinity***
- Index(es):
 - ◆ ***Date***
 - ◆ ***Thread***