

# Re: An uncountable countable set

---

*Source:* <http://sci.tech--archive.net/Archive/sci.math/2006-07/msg00830.html>

---

- *From:* Virgil <vmhjr2@xxxxxxxxxxxx>
  - *Date:* Wed, 05 Jul 2006 17:29:17 -0600
- 

In article <1152133914.661066.91950@xx>, mueckenh@xxxxxxxxxxxxxxxx wrote:

Virgil schrieb:

0.111.. is not in the list, then  
it must have more digits  
than can be  
indexed (and hence, can  
exist).

They are satisfactorily indexed by the  
infinite set of finite natural  
numbers,  $\mathbb{N}$ .

You just proved that there are infinitely digit positions which  
are not  
indexed by natural numbers (\*all\* of which are given in the  
list).

Having infinitely many does not require that any one of them be  
infinitely large.

And each of the infinitely many naturals is only finitely large.

Either the diagonal number 0.111... is not distinguished from all  
finitely large numbers of the list

0.  
0.1  
0.11  
0.111  
...

Re: An uncountable countable set

then Cantor's proof fails.

Or 0.111... is distinguished from all finitely large numbers of the list

0.1

0.11

0.111

...

then the digits of 0.111... cannot all be indexed by natural numbers.

OR, as is actually the case, the endless sequence of 1's fraction 0.111... is distinct from every finite truncation of it AND every digit of it CAN be indexed by a natural number.

So that the actuality is that both of "mueckenh"'s alternatives are wrong simultaneously.