

## Re: Zenkin's paper on Cantor (reply of Dr. Zenkin)

*Source:* <http://coding.derkeiler.com/Archive/General/comp.theory/2004-11/0276.html>

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Date: 21 Nov 2004 04:39:19 GMT

In sci.math Eray Ozkural exa <examachine@gmail.com> wrote:  
: stephen@nomail.com wrote in message news:<cnmolo\$1gp8\$1@msunews.cl.msu.edu>...  
:> In sci.math Eray Ozkural exa <examachine@gmail.com> wrote:  
:> : stephen@nomail.com wrote in message news:<cnldto\$b2e\$1@msunews.cl.msu.edu>...  
:> :> In sci.math Eray Ozkural exa <examachine@gmail.com> wrote:  
:> :> : We use the concept of bijection to reason about the equivalence of the  
:> :> : "sizes" of supposedly infinite sets, like natural numbers. Under the  
:> :> : axioms of ZFC, we can comfortably talk about a bijection between even  
:> :> : and odd numbers, and even numbers and all natural numbers. However,  
:> :> : this would fail if we were to give the "subset" account of comparing  
:> :> : the magnitudes or sizes of supposedly infinite sets. Which one is  
:> :> : correct?  
:> :>  
:> :> That is a meaningless question. Two sets have the same cardinality  
:> :> if there exists a bijection between them. That is the definition.  
:> :> How can you claim that the definition is not correct?  
:> :>  
:> :> If we defined "same cardinality" differently then of course  
:> :> sets that had the same cardinality under the old definition  
:> :> might no longer have the same cardinality under the new definition.  
:> :> No surprise there. The only interesting question is which  
:> :> definitions are more useful.  
:>  
:> : And that is exactly the question in philosophy of mathematics!  
:> : Bijection is apparently not seen as the only sensible way to define  
:> : "same cardinality"! I bet you never heard that!  
:>  
:> : I have heard that. The point is that that is how "same cardinality"  
:> : is defined. Yes, you can consider other definitions, but to avoid  
:> : confusion it would make sense to call it something else, as  
:> : "cardinality" has already been defined.  
  
: It is obvious what cardinality means, and it is not a definite thing,  
: because THIS PARADOX EXISTS. If you do not understand WHY this is a  
: paradox this is your problem.

: Do you accept that there is a paradox or not?

: Yes or no?

What paradox are you talking about? There is no paradox involved with defining cardinality in terms of bijections of which I am aware. I would not call it paradoxical that different definitions of cardinality could be considered that lead to different conclusions. All results in mathematics are based upon your assumptions. Change the assumptions and the results change.

Stephen