

Re: Cantor's diagonal proof wrong?

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From: Dave Seaman (*dseaman_at_no.such.host*)

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On 21 Nov 2004 17:54:27 GMT, Curt Welch wrote:

> *Dave Seaman <dseaman@no.such.host> wrote:*

>> *Do you agree that $|N| < |P(N)|$?*

> *For finite sets, it's obvious that the size of N is < size of the $P(N)$.*

N is not a finite set. N is the set of natural numbers. Cantor's proof that $|X| < |P(X)|$ makes no mention of whether X is finite or infinite, nor does it need to.

> *For infinite sets, the question seems to me to be invalid to ask.*

Nonsense. The question being asked is whether you agree that

- 1) there is an injection $f: X \rightarrow P(X)$, and
- 2) there is no surjection from X onto $P(X)$.

You may possibly misunderstand the proof, but there is no doubt about whether the question is meaningful. The question doesn't even mention whether X is finite or infinite.

Notice that 1) means $|X| \leq |P(X)|$, and 2) implies there is no bijection, and therefore equality does not hold.

> *It's exactly like the following word problem: If we built one machine to count to infinity which can count one number per second, and a second machine which can count at the speed 2^T numbers per second, where T is how long the machines have been running, which machine will finish first?*

No, it's not even remotely like that problem. You didn't even mention anything about injections or surjections.

> *That question is just flat out invalid to ask. There is no answer.*

Agreed. Now, can we get back to the question I originally asked?

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- > *But, in set theory, it seems the question is not seen as invalid to ask, so*
- > *I don't understand set theory yet. And if I don't understand set theory, I*
- > *can't answer your questions about set theory.*

Then perhaps the explanation above will help.

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Dave Seaman

Judge Yohn's mistakes revealed in Mumia Abu-Jamal ruling.

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