

# Re: Cantor Confusion

---

*Source:* <http://sci.tech-archive.net/Archive/sci.math/2006-12/msg06790.html>

---

- *From:* [stephen@xxxxxxxxxxx](mailto:stephen@xxxxxxxxxxx)
  - *Date:* Tue, 26 Dec 2006 07:51:14 +0000 (UTC)
- 

Newberry <[newberry@xxxxxxxxxxx](mailto:newberry@xxxxxxxxxxx)> wrote:

Virgil wrote:

In article <1167094506.703211.116860@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx>, "Newberry" <[newberry@xxxxxxxxxxx](mailto:newberry@xxxxxxxxxxx)> wrote:

David Marcus wrote:

Newberry wrote:

paths edges  
level 1:  $2 = 2^1$  2  
level 2:  $4 = 2^2$  6  
level 3:  $8 = 2^3$  14

level n:  $2^n$  (not sure what the formula is)

Does the ratio edges/paths converge to 2 for  $n \rightarrow$  infinity?

Yes, as WM is fond of repeating ad nauseum.

It certainly makes it highly counterintuitive that there are more paths than edges although I do not know if it generates a flat contradiction.

Yes, it is counterintuitive (depending on

## Re: Cantor Confusion

your intuition). No, there is no contradiction.

Just because a system avoids a contradiction of the type  $P \ \& \ \sim P$  does not mean that it is justified. For example an omega-inconsistent system may not produce any  $P \ \& \ \sim P$  and would be still unacceptable. Similarly a system in which we can prove that

$$\#edges = 2 * \#paths$$

and at the same time that the cardinality of paths is greater than the number of edges is unacceptable.

If you wish to argue that because the ratio of paths to edges (or nodes) in finite trees is bounded that it must by some sort of limit argument remain bounded for infinite trees, then you must allow the same argument for the ratio of paths to terminal nodes.

What exactly is wrong with the limit I (or rather WM, got to give him credit) have calculated?

It has nothing to do with the infinite case.

Is it true that at each level  $(2 * 2^n - 2) / 2^n$ ?

There is no finite level  $n$  for an infinite tree, and you cannot just toss transfinite cardinals into an equation willy nilly and expect it to make sense.

Is it true that  $\lim_{n \rightarrow \infty} (2 * 2^n - 2) / 2^n = 2$ ?

Yes, but what does that have to do with anything?  
Explain why you think that limit is relevant?

Is it true that the cardinality of the index  $n$  is the same as the cardinality of the edges in an infinite path?

## Re: Cantor Confusion

What index  $n$ ? There is no  $\aleph_0$  level. You are apparently just trolling at this point, as all of this has been explained to you and you have simply ignored the explanations.

Do you think that an infinite tree has zero leaf nodes?  
Do you agree that the limit of the ratio of nodes to leaf nodes is 2 as the tree gets large?

I guess you do think that  $2^{\infty} = \infty$  after all.

Stephen

.