Re: infinity

Source: http://sci.tech−archive.net/Archive/sci.math/2005−09/msg01279.html

- *From*: imaginatorium@xxxxxxxxxxxxx
- *Date*: 6 Sep 2005 12:01:21 −0700

aeo6 Tony Orlow wrote:
> imaginatorium@xxxxxxxxxxxxx said:
> > Tony Orlow (aeo6) wrote:
> > > Virgil said:
> > > > In article <MPG.1d7f9000c6e111a298a19f@xxxxxxxxxxxxxxxxxxxxxxxxx>,
> > > > Tony Orlow (aeo6) <aeo6@xxxxxxxxxxx> wrote:
> > > > ...[?]
> > > > > > > > I mapped paths from the same tree ...
> >
> > That's enough. I'm generally avoiding both tree and vase arguments,
> > since they are far too complex. But let's just try a little...
> >
> > > Let us try inductive proofs regarding the relationship between branches and
> > > paths.
> >
> > Uh−oh. OK, I'll try as well. I'll investigate how many ends there are
> > in an endless tree (that's one in which every node branches into two
> > child nodes, and this never never never never ends). Intuitively, I'd
> > expect that an endless tree would not have any ends, since I've defined
> > it that way, but let's see.
> >
> > > Proof: In a maximal binary tree, number of paths is half the number of
> > > branches, plus 1.
> > >
> > > 1. For an empty tree consisting of the root node, there is one path in the
> > > tree, of length zero, and no branches. 1 path = 0 branches/2 + 1.
> >
> > For an "empty" [not quite the right word, is it] tree, there is one
> > end.
> Uh, yeah, one path, like I said.

Look, you have written your "proof" − I'm interlining my "proof", a
different "proof", of something different. (What do you mean by "path"?
Is it a 'way through the tree'?)

<snip>

> > > Proof: In a maximal binary tree with paths of length n, or depth of n, there
> > > are p(n)=2^n paths and b(n) = 2(2^n−1) = 2(p(n)−1) branches.

> >
> > What do you mean by "Proof"? Isn't this still part of the same
> > argument? You would get more respect if you took the trouble to
> > understand elementary notational conventions.
> This was a second proof, using a slightly different statement.

Oh, OK. In a tree that terminates at depth n, p(n) is the number of terminal nodes, and b(n) is the number of 'branches', where a branch is a link from one node to its child. Yeah, OK, I agree with the 'numbers'.

> > Anyway, never mind: to finish off *my* proof... By induction, the
> > number of ends of an endless tree is infinity. Da−dah!!
> yes, you are very clever......

Well, I'd like you to address the substantive issue. Seems to me that if one were to consider an unending tree, each path through it would be unending, so there would be some infinite number of branches, but there would also be zero leaf nodes. Do you agree?

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