Re: Why is it so difficult?

Source: http://sci.tech−archive.net/Archive/sci.math/2007−08/msg02540.html

- *From*: mike3 <mike4ty4@xxxxxxxxx>
- *Date*: Thu, 16 Aug 2007 01:59:38 −0700

On Aug 15, 7:02 pm, "I.N. Galidakis" <morph...@xxxxxxxxxxxx> wrote:

> mike3 wrote:
>
> > On Aug 15, 3:54 pm, "I.N. Galidakis" <morph...@xxxxxxxxxxxx> wrote:
>
> [snip]
>
> > > If y=x^^{1/n} and x is given, after one computes y, then
> > > indeed
> > > y^^n=x.
>
> > But how does that mean it makes sense to define ^(1/n) x to
> > be the solution of ^n y = x? Why couldn't we define
> > ^(1/(n^2)) x as the solution???
>
> Because y=x^^{1/n^2} contrasts badly (at an operator level) with its inverse
> operation: The inverse operation is y^^n, not y^^{n^2}.

How does it contrast badly, when you don't even know what ^(1/n) x is
supposed to mean?

> In other words, you need
> to tetrate y, n−times. NOT n^2−times to get back x. Usually a consistent
> mathematical concensus requires "inverse" operators to be related in the
> simplest way possible, and in this case the "natural choice" is taken (as an
> analogue) from the corresponding relationship between the operators "n−th root"
> and "n−th power".

So then it's because

x + 1/2 is doing half the "add one" function to x.
x * 1/2 is doing half the "add x" function to 0.
x ^ 1/2 is doing half the "multiply by x" function to 1.
^1/2 x is doing half the "exponentiate x" function.

right?

> What problems does one
> run into when attempting to use a definition like that
> that make it less "natural" and more "contrived"?
> But from what I've examined the definition of
> "tetraroot" simply only requires that a solution
> y to the equation ^n y = x exists, NOT that y =
> ^(1/n) x.

I am sorry, I don't understand your question. It seems that the notation x^^{1/n} bothers you for some obscure (to me) reason.

Because it seems to be based off the mistaken idea that ^m (^n x) = ^(mn) x. It's OK to have x^(1/n) as the n−th root of x since (x^m)^n = x^(mn).

Yeah, I guess you could define y instead as:

x^^{Gobledygookery−biscuit+i^56135+gazeebo*superdooper/n!*1/Gamma(Ronald McDonald))},

<soda squirts all over the keyboard>

<falls out of chair>

<rolls around laughing so hard it wakes up the neighboorhood>

Good <laughlaughgigglegiggle> o.. <laughlaugh> on.. <giggle> one!!!
<giggling some more>

> to be that number, which if you tetrate it n−times you get back x. The notation for the 1/n is merely a symbol place holder similar to the symbol place holder x^{1/n} for a regular n−th root, reminiscent of the operation for which this is a solution. Such a number exists always when x,y > 1, is unique, and no matter how you want to call it, it can be calculated to any degree of accuracy.

<still giggling a little from that... heh... above>

Does this mean you don't intend for ^(1/n) x to correspond to the
tetration, and instead just use it as a convenient notational trick?

> [snip]
> −−
> I.N. Galidakis

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