Re: Bringing back an old tetration curiosity?

Source: http://sci.tech−archive.net/Archive/sci.math/2007−09/msg03731.html

- *From*: theronruiz@xxxxxxxxx
- *Date*: Mon, 17 Sep 2007 10:22:10 −0700

On Sep 17, 6:12 pm, theronr...@xxxxxxxxx wrote:

> On Sep 17, 10:12 am, mike3 <mike4...@xxxxxxxxx> wrote:
>
>> I dug up an interesting thread here where a method was given that
>> might be able to extend
>> tetration to the reals, at least for a base of sqrt(2). You can see
>> the thread at this link:
>>
>> http://groups.google.com/group/sci.math/browse_frm/thread/39a7019f905...
>
> The proposed method in this thread is flawed. The generated "curve"
> has branches, so it is not a function. This is easily observable in hi−
> res plot of the "curve".
>
> This proves experimentally that there is no function f: (−2; +oo) −> R
> such that:
> f(x) = y <=> f(−y) = −x (1)
> f(x + 1) = sqrt(2)^f(x) (2)
> f(0) = 1 (3)

After rethinking I think that the above statement is a bit
speculative. However I'm sure that there is no continuous f: (−2; +oo)
−> R that satisfies (1), (2) and (3). Here is why:

http://img403.imageshack.us/img403/1466/sqrttetrxjx1.png

This is a 5000x5000 plot of f(x) for −1 <= x <= 0 <= y <= 1.

Theron

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