Re: fractional iteration of functions

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> *A number of schemes have been proposed for continuous and*
> *fractional iteration, but they are mostly algorithmic in nature.*
Someone
> *I respect suggested that a number of scientists realize many such*
> *algorithms can exist; the issue is whether someone can provide a*
> *rigorous axiomatic basis for such studies that provides a solid*
> *foundation and provides a deeper mathematical understanding of the*
subject.
> *Daniel Geisler*

Wow, first, thanks for all the responses. I now have more then enough references to investigate. I have gotten a good response on this question. Second, I would like to respond to Mr. Geisler's last comment about axiomatic basis for function iteration. I think that will be the goal of the paper I write. Well, at least an axiomatic basis for well behaved functions over the complex plane.

It seems there are some very serious open questions relating to this subject. One question I find personally very interesting, relates to how many iterative function solutions a particular function should have. For instance take f(f(x)) = e^x. The function e^x has no fixed point on the real line but an infinity of them in C. Does each new fixed point create its own solution for an iteration function? Are there solutions of the iteration function outside of the fixed points?

For instance f(x) = 6 + 2x − x^2, has two fixed points x = 3 and x = −2. Using the method I alluded to in the first post, you can generate two series solutions to f(x) from the fixed points. So does the function above have more then one 2 solutions for the iteration function, or does it have exactly 2?
Of course this could have been answered years ago in other papers for all I know...

Yours,
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