Re: Attempt epsilon−delta

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From: Arturo Magidin (*magidin_at_math.berkeley.edu*)
Date: 10/01/04

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Date: Fri, 1 Oct 2004 13:47:05 +0000 (UTC)
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In article <cjjib9$9cbh$1@murrow.it.wsu.edu>,
Chris Wagner <clwagner@vulcan.wagner.nul> wrote:
>In article <cjevb0$1q9h$1@agate.berkeley.edu>,
> magidin@math.berkeley.edu (Arturo Magidin) writes:

[.snip.]

>It did seem a bit tautological to me. My purpose was to simplify so I
>could understand epsilon−delta well enough to construct proofs. It is
>my understanding that the Cauchy−Weierstrass epsilon−delta method is
>considered definitive, that is, if I can correctly do e−d I can Prove
>claims about limits.
>
>>
>> I assume that you are using the following definitions for limit and
>> for "continuity at x=a":
>>
>> DEF. Let f(x) be a function. The limit as x goes to a of f(x) is equal
>> to L, lim_{x−>a} f(x) = L if and only if
>>
>> for every e>0 there exists d>0 such that
>>
>> if 0< | x−a | < d, then |f(x)−L|< e.
>>
>>
>> DEF. Let f(x) be a function. Then f(x) is continuous at a if and only
>> if f is defined at a, and
>>
>> for every e>0 there exists d>0 such that
>>
>> if |x−a| < d, then |f(x)−f(a)|<e.
>>
>
>These are indeed the e−d definitions I hope to apply. I read the
>definitions in Rudin's "Principles of Mathematical Analysis" (third
>ed.), begining of chapt 4.
>
>Perhaps I can state my problem directly from the two definitions

>quoted above:
>
>Given continuous function f(x) and e>0 what is d? I need to
>understand how to construct the d (my response to your e challenge),
>since that seems to be the essence of doing such proofs.
>
>>>Let
>>>epsilon>0 be given. Using the Mean Value Theorem (MVT)
>>
>> I'm the one who usually uses cannonballs to swat flies... but isn't
>> this a bit beyond that?
>
>Urk−gulp.
>
>[snip]
>>
>> Look at the definitions above. Can you not see why if the second one
>> holds, then the first one will hold with L=f(a)?
>
>OK, if the second definition holds then we know there is a delta. But
>what is it? (d as function of f and e)

Huh? Why do you think you can express d "as [a] function of f and e"?

What's more: why do you think you −>have<− to do so?

Look at the definition: all you have to do is show that one
exists. Since you know one exists, by continuity, you are −>done<−.

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======================================================================
"It's not denial. I'm just very selective about
 what I accept as reality."
    --- Calvin ("Calvin and Hobbes")
======================================================================
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