Re: Another question about derivatives

Source: http://sci.tech−archive.net/Archive/sci.math/2005−12/msg04715.html

- *From*: quasi <quasi@xxxxxxxx>
- *Date*: Mon, 26 Dec 2005 19:17:04 −0500

On Mon, 26 Dec 2005 16:01:23 −0800, The World Wide Wade
<waderameyxiii@xxxxxxxxxxxxxxxxxxxx> wrote:

>In article <sjv0r1halu60n0apifo8p0u7cc0alof88n@xxxxxxx>,
> quasi <quasi@xxxxxxxx> wrote:
>
>> On Mon, 26 Dec 2005 15:29:32 −0800, The World Wide Wade
>> <waderameyxiii@xxxxxxxxxxxxxxxxxxxx> wrote:
>>
>> >In article <u1m0r1tj1h80gcts8nu7m421on57rs8r3k@xxxxxxx>,
>> > quasi <quasi@xxxxxxxx> wrote:
>> >
>> >> On Mon, 26 Dec 2005 12:02:55 −0800, The World Wide Wade
>> >> <waderameyxiii@xxxxxxxxxxxxxxxxxxxx> wrote:
>> >>
>> >> >In article
>> >> ><1135625922.654371.258210@xxxxxxxxxxxxxxxxxxxxxxxxxxxx>,
>> >> > "Stephen J. Herschkorn" <sjherschko@xxxxxxxxxxxx> wrote:
>> >> >
>> >> >> Let f be a continuous, real−valued function on the open interval
>> >> >> (−1, 1). Suppose f is differentiable on (−1, 0) U (0, 1) and that
>> >> >> f'(x) approaches 0 as x approaches 0. Is f necessarily
>> >> >> differentiable at 0?
>> >> >
>> >> >Yes, by the mean value theorem.
>> >>
>> >> I don't see it.
>> >>
>> >> Can you show more of the details?
>> >
>> >[f(x) − f(0)]/(x−0) = f'(c_x) by the MVT. As x −> 0, c_x −> 0,
>> >which by hypothesis implies f'(c_x) −> 0.
>>
>> But you want to prove f'(0) exists.
>>
>> You already know that lim f'(x) −−> 0 as x −−> 0. That's part of the
>> hypothesis.
>>
>> Thus, establishing that f'(c_x) −−> 0 seems unproductive.

>
>I see we're having a little too much eggnog during the holidays.
>[f(x)−f(0)]/(x−0) = f'(c_x), right? So if f'(c_x) −> 0, then ...

then lim f'(x) −−> 0 as x −−> 0.

What am I missing?

quasi
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- ***Follow−Ups***:
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