Re: directional derivative,−

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- *From*: JEMebius <jemebius@xxxxxxxxx>
- *Date*: Tue, 24 Apr 2007 01:43:40 +0100

What about the well−known rectangular circular half−cone,
the graph of (x, y) −> z = sqrt(x^2 + y^2)?

At first sight the problem seems underspecified? incompletely posed? badly posed? provocative, i.e. aimed at putting in motion the reader's creativity?

Or did the author mean to ask:
"Prove that no real−valued function f ==that has a continuous derivative at a point C==
has a positive directional derivative at C for every possible direction u."

BTW, the paraboloid (x, y) −> z = x^2 + y^2 does not qualify because the slope at (0, 0) is zero in every direction.
This example shows that zero local slope is not in contradiction to positive average slope.

Ciao: Johan E. Mebius

chrizm7@xxxxxxxxx wrote:

> A problem asks me to show that no real−valued function f has a
> positive directional derivative at a fixed point c for every possible
> direction u.
>
> But wouldn't a paraboloid work? Fix c corresponding to the vertex.
> Then for any direction u, the slope will always be positive
> (increasing).
>
> To be clear, the exact problem is worded: Prove that there is no real−
> valued function f such that f'(c;u) > 0 for a fixed point c in R^n and
> every nonzero vector u in R^n.

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