

second order condition

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Hi!

I would like to know if the following assertion is true or not :

Let f be a function defined on a Banach space X , f has a Frechet derivative f' of the first order on a neighbourhood of some point x in X and have second-order Gateaux derivative $D^2 f(x)$ at the point x .

If $f'(x)=0$ and

there is $c>0$ s.t.

for any h in X it holds : $D^2 f(x)[h,h] \geq c|h|^2$,

then f attains a strict local minimum at the point x .

If this is not true, find some counterexample.

Thank you in advance. Dusan