Higher order Glaeser inequalities and optimal regularity of roots of real functions

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(Submitted on 13 Jul 2011 (v1), last revised 26 Jan 2012 (this version, v2))

We prove a higher order generalization of Glaeser inequality, according to which one can estimate the first derivative of a function in terms of the function itself, and the Holder constant of its k-th derivative.
We apply these inequalities in order to obtain pointwise estimates on the derivative of the (k+alpha)-th root of a function of class C^{k} whose derivative of order k is alpha-Holder continuous. Thanks to such estimates, we prove that the root is not just absolutely continuous, but its derivative has a higher summability exponent.
Some examples show that our results are optimal.

Comments:	20 pages (references updated, restatement of the main result in terms of weak L^p spaces, new proof of the key step)
Subjects:	**Classical Analysis and ODEs (math.CA)**
MSC classes:	26A46, 26B30, 26A27
Cite as:	**arXiv:1107.2694 [math.CA]**
	(or **arXiv:1107.2694v2 [math.CA]** for this version)

Submission history

From: Massimo Gobbino [view email]
[v1] Wed, 13 Jul 2011 22:56:00 GMT (20kb)
[v2] Thu, 26 Jan 2012 16:18:12 GMT (18kb)