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Superquadratic functions in several variables

Abstract: The concept of superquadratic functions was recently introduced by S. Abramovich, G. Jameson and G. Sinnamon in paper "Refining Jensen's inequality". The definition of such function is based on a simple modification of the geometrical definition of convex function via support lines (tangent lines) by introducing an extra term that depends on function which is considered. In the case when such function is positive it is necessarily convex and Jensen's inequality for that function can be refined.

In joint paper "Superquadratic functions in several variables" (J. Math. Anal. Appl., in press) S. Abramovich, S. Banić and M. Matic defined superquadratic functions in several variables. It was shown that analogous results are valid for such functions as in the one variable case. Especially when such function is positive it is also convex and refinement of Jensen's inequality is obtained as well as refinements of several companion inequalities, considered earlier by M. Matic and J. Pečarić. Further it is not easy to give a nontrivial examples of superquadratic functions in several variables. In the paper some additional results were obtained which enabled a construction of a wide class of nontrivial superquadratic functions. Some interesting examples are also given.