

Jensen's inequality for functions superquadratic on the coordinates in a plane

(Talk)

Senka Banić

Faculty of Civil Engineering, Architecture and Geodesy, University
of Split

Senka.Banic@gradst.hr

(joint work with Milica Klaričić Bakula)

In 2004 S. Abramovich, G. Jameson and G. Sinnamon introduced a new interesting class of functions: the class of *superquadratic functions*.

We say that the function φ is superquadratic if for any $x \geq 0$ there exists $C(x) \in \mathbb{R}$ such that

$$\varphi(y) \geq \varphi(x) + C(x)(y-x) + \varphi(|y-x|), \quad \forall y \geq 0.$$

In 2007 S. Abramovich, S. Banić and M. Matić generalized this concept for the functions in several variables.

The class of superquadratic functions is strongly related to the class of convex functions: it can be proved that any nonnegative superquadratic function is convex. Using some previously proved characterizations and properties of this new class we establish "superquadratic variants" of several well known inequalities for convex functions. The refinements of many important inequalities for convex functions easily follow as special cases when considered superquadratic functions are nonnegative.

Here we deal with the class of functions in two variables which are superquadratic on the coordinates. It can be proved that a function which is superquadratic on the coordinates is not necessarily superquadratic and vice versa. The important property of this class of functions is the fact that any nonnegative function superquadratic on the coordinates is also convex on the coordinates. This enables us to give some refinements of the results for the functions which are convex on the coordinates established in 2006 by M. Klaričić Bakula and J. Pečarić.

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