

A CLASS OF NEW TRIGONOMETRIC INEQUALITIES AND THEIR SHARPENINGS

KUN ZHU, HONG ZHANG AND KAIQING WENG

Abstract. Some sufficient or necessary conditions for Schur-convexity of a function of two variables $F(x, y) = (f(y) - f(x))/(g(y) - g(x))$ were considered. These results are applied to establish a class new inequalities in a triangle. In the fourth section we prove two theorems for a kind of symmetric function. These theorems are used to sharpen some of the inequalities and yield two inequalities in the last section.

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REFERENCES

- [1] O. BOTTEMA, R. Z. DJORDJEVIĆ, R. R. JANIĆ, D. S. MITRINOVIĆ, P. M. VASIĆ, *Geometric Inequalities*, Wolters-Noordhoff Groningen, translated into Chinese by Zun San, **16** (1969).
- [2] B. C. CARLSON, *The Logarithmic Mean.*, Amer. Math. Monthly, **79** (1972), 615–618.
- [3] J. M. CHILD, *Unknown Title.*, Math. Gazette, **23** (1939), 138–143.
- [4] A. W. MARSHALL, I. OLKIN, *Inequalities: Theory of Majorization and Its Applications.*, Academic Press, New York, **7** (1979), 64.
- [5] MILAN MERKLE, *Conditions for Convexity of A Derivative and Applications to The Gamma and Digamma Function*, AFacta Universitatis, Ser. Math. Inform., **16** (2001), 13–20.