ON MAJORIZATION, FAVARD AND BERWALD INEQUALITIES

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ABSTRACT. In this paper, we obtain extensions of majorization type results and extensions of weighted Favard's and Berwald's inequality. We prove positive semi-definiteness of matrices generated by differences deduced from majorization type results and differences deduced from weighted Favard's and Berwald's inequality. This implies a surprising property of exponentially convexity and log-convexity of these differences which allows us to deduce Lyapunov's and Dresher's inequalities for these differences, which are improvements of majorization type results and weighted Favard's and Berwald's inequalities. Analogous Cauchy's type means, as equivalent forms of exponentially convexity and log-convexity, are also studied and the monotonicity properties are proved.

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