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About the equivalence of some classical inequalities. I.

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Summary: The equivalence of the classical inequalities studied in [*G. H. Hardy* et al., Inequalities. Cambridge: Univ. Press (1934; Zbl 0010.10703); *L. Maligranda*, Math. Inequal. Appl. 1, No. 1, 69–83 (1998; Zbl 0889.26001); ibid. 4, No. 2, 203–207 (2001; Zbl 0987.26011); *A. W. Marshall* and *I. Olkin*, Inequalities: theory of majorization and its applications. New York etc.: Academic Press (1979; Zbl 0437.26007)], follows from Jensen inequality as a property of the convex functions. Following a long way, but simple and generally, in this paper we show that the equivalence of classical inequalities in finite dimensional case can be proved without using directly Jensen inequality.

Classification: H30 I30
Keywords: Cauchy inequality; root-mean-square inequality; rearrangement inequality; Cauchy-Bunyakovski-Schwarz inequality; Bernoulli inequality; Young inequality; Rado-Popoviciu inequality; Maclaurin inequality; Maclaurin inequality; Rogers-Hölder inequality; Rogers inequality; Lyapunov inequality; power-mean inequality; Minkowski inequality