On Clarkson's inequality in the real case

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Abstract

The best constant in a generalized complex Clarkson inequality is $C_{p,q}(\mathbb{C}) = \max\{2^{1-1/p}, 2^{1/q}, 2^{1/q-1/p+1/2}\}$ which differs moderately from the best constant in the real case $C_{p,q}(\mathbb{R}) = \max\{2^{1-1/p}, 2^{1/q}, B_{p,q}\}$, where $B_{p,q} = \sup_{x\in[0,1]} \frac{((1+x)^q+(1-x)^q)^{1/q}}{(1+x^p)^{1/p}}$. For $1 < q < 2 < p < \infty$ the constant $C_{p,q}(\mathbb{R})$ is equal to $B_{p,q}$ and these numbers are difficult to calculate in general. As applications of the generalized Clarkson inequalities the (p, q)-Clarkson inequalities in Lebesgue spaces, in mixed norm spaces and in normed spaces are presented.

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