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Polynomial Inequalities on the $\pi/4$–Circle Sector

A number of sharp inequalities are proved for the space $\mathcal{P}\left({}^2D\left(\frac{\pi}{4}\right)\right)$ of 2-homogeneous polynomials on $\mathbb{R}^2$ endowed with the supremum norm on the sector $D\left(\frac{\pi}{4}\right) := \left\{e^{i\theta} : \theta \in \left[0, \frac{\pi}{4}\right]\right\}$. Among the main results we can find sharp Bernstein and Markov inequalities and the calculation of the polarization constant and the unconditional constant of the canonical basis of the space $\mathcal{P}\left({}^2D\left(\frac{\pi}{4}\right)\right)$.

Keywords: Bernstein and Markov inequalities, unconditional constants, polarizations constants, polynomial inequalities, homogeneous polynomials, extreme points.

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