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The Best Constants in the Strong Convexity of $|\xi|^p$ and in the Strong Monotonicity of $|\xi|^{p-2}\xi$

We prove that the function $\xi \in \mathbb{R}^N \rightarrow |\xi|^p$ is strongly convex for every element $p \in]1, +\infty[$, and we give a characterization, through the resolution of an algebraic equation, of the best constant which appears in the strong convexity inequality. The same proof allows us to prove that the function $\xi \in \mathbb{R}^N \rightarrow |\xi|^{p-2}\xi$ is strongly monotone and to identify the explicit value of the best constant.

Keywords: Strong convexity, strong monotonicity, best constants.

MSC: 26B25.