AFFINE POLYÁ-SZEGÖ PRINCIPLES

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ABSTRACT. The Pólya–Szegö principle states that the L^p norm of the gradient of a function on $\mathbb{R}^n$ does not increase under symmetric rearrangement. An affine analogue of the Pólya–Szegö principle – stronger than its classical counterpart – was recently established by Cianchi, Lutwak, Yang, and Zhang. We present an asymmetric version of this affine Pólya–Szegö principle. This new version is stronger than and directly implies all its predecessors. As a consequence, several sharp Sobolev inequalities are established, all of which are stronger than the classical ones.