A NEW REVERSE ISOPERIMETRIC INEQUALITY AND ITS STABILITY

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Abstract. In this paper, we deal with the reverse isoperimetric inequality for a closed and strictly convex curve in the Euclidean plane $\mathbb{R}^2$ involving the following geometric functionals associated to the given convex curve: length, areas of the region respectively included by the curve and the locus of curvature centers, and the integral of the radius of curvature. In fact, a stronger and sharp version of the reverse isoperimetric inequality proved by Pan and Yang in [1] is established with a simple Fourier series proof. Furthermore, we investigate the stability property of such an inequality (almost equality implies that the curve is nearly circular).

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REFERENCES