

# On mappings related to the gradient of the conformal radius

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## Abstract

We establish a criterion for the gradient  $\nabla R(D, z)$  of the conformal radius of a convex domain  $D$  to be conformal: the boundary  $\partial D$  must be a circle. We obtain estimates for the coefficients  $K(r)$  for the  $K(r)$ -quasiconformal mappings  $\nabla R(D, z)$ ,  $D(r) \subset D$ ,  $0 < r < 1$ , and supplement the results of Avkhadiiev and Wirths concerning the structure of the boundary under diffeomorphic mappings of the domain  $D$ . © Pleiades Publishing, Ltd., 2010.

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## Keywords

Astroid, Coefficient of quasiconformality, Conformal radius, Convex mapping, Cycloid, Gradient of the conformal radius, Hypocycloid