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8. Analysis

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Area Problem for quasiconformal mappings

Let A be an n-multiply connected domain of the extended complex plane containing 0 and z_1. Let F be the class of K-quasiconformal mappings $w = f(z)$ of A satisfying $f(0) = 0$, arg $f(z_1) = 0$ and, where $s(r)$ is the area of the image of the disk $|z| < r$ under the mapping f. Denote by $S(f)$, $f \in F$, the area of $f(A)$. The problem now consists in finding all the particular functions $f_0 \in F$ satisfying $S(f)S(f_0), f \in F$. It is showed that any extremal domain $f_0(A)$ must be a disk $|w| < R$ with $n-1$ concentric circular slits and the largest number of extremal functions may be n.

Reference: V. D. Thao, Quelques inégalités d'aires pour les représentations quasi-conformes, Rev. Roumaine Math. Pures Appl. 36 (1991), 9-10, 521-527.