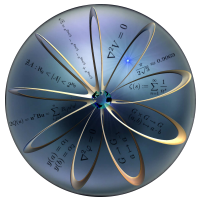

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Riemann mapping theorem

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Let U be a simply connected open proper subset of $\mathbb{C}$, and let $a \in U$. There is a unique analytic function $f : U \to \mathbb{C}$ such that

1. $f(a) = 0$, and $f'(a)$ is real and positive;
2. f is injective;
3. $f(U) = \{z \in \mathbb{C} : |z| < 1\}$.

Remark. As a consequence of this theorem, any two simply connected regions, none of which is the whole plane, are conformally equivalent.