

HOMework 4

1. Give a complete proof of the following property: let D be a Jordan domain in \mathbb{C} . Then any conformal automorphism f of D extends to ∂D , and is uniquely determined by images of 3 distinct boundary points a, b, c .
2. For $f(z) = z^3 e^{1/z}$, determine $f(\mathbb{C} \setminus \{0\})$.
3. For the (Weierstrass) analytic function $F(z) := \operatorname{Ln}(1 + \sqrt{1 + z^2})$, determine its domain, all its branch points in $\overline{\mathbb{C}}$, characterize its branching at each of those points, and at each algebraic branch point determine three nonzero terms in its Puiseux series.