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On conformal representation of the interior of an ellipse

We consider the conformal mappings f and g of the unit disk onto the inside of an ellipse with foci at ± 1 so that $f(0) = 0$, $f'(0) > 0$, $g(0) = -1$ and $g'(0) > 0$. The main purpose of this article is to show positivity of the Taylor coefficients of f and g about the origin. To this end, we use a special relation between f and g and the fact that f satisfies a second-order linear ODE. Some application are given to the class of k -uniformly convex functions.