Problem 1. Prove the following statement:
let $f_c(z) = z^2 + c$ be a quadratic polynomial such that the critical orbit $f_c^n(0) \to \infty$. Then the filled Julia set $K(f_c)$ is totally disconnected (and hence, a planar Cantor set).

Problem 2. Write a detailed proof of the Voronin-Écalle classification theorem, which answers the following question: let $f(z)$ be a germ of an analytic mapping defined near $z = 0$ with $f(z) = z + z^2 + \cdots$, and let $g(z) = z + z^2 + \cdots$ be another such germ. Under what conditions does there exist a conformal change of variables $\phi(z)$ defined in a neighborhood of the origin, with $\phi(0) = 0$ and such that

$$\phi \circ f \circ \phi^{-1} = g.$$

Helpful references: J. Milnor's book "Dynamics in one complex variable" (Ch. 10), and the paper Buff X and Epstein A. "A parabolic Pommerenke-Levin-Yoccoz inequality", Fundamenta Math., 72, (2002), 249 -289