that restricts to a d-sheeted covering: $\pi : D^* \to \Delta^*$
$\{|(z_1, z_2, z_3)| \leq \delta \ , \ z_3 \neq 0\}$. Now we use the by-now-familiar argument involving the elementary symmetric functions:

set

$$\varphi_i(z_1, z_2, z_3) = \frac{1}{2\pi\sqrt{-1}} \int_{|z_4| = \epsilon} z_4^{\,i} \, \frac{dh(z_1, z_2, z_3, z_4)}{h(z_1, z_2, z_3, z_4)}$$

$$= \sum_{\nu=1}^{d} z_{4,\nu}(z_1, z_2, z_3)^i,$$

where $\pi^{-1}(z_1, z_2, z_3) = \{ z_{4,\nu}(z_1, z_2, z_3)\}_\nu$. The $\varphi_i(z_1, z_2, z_3)$ are holomorphic and bounded in $\{|(z_1, z_2, z_3)| \leq \delta, z_3 \neq 0\}$, and hence they extend to holomorphic functions on the full $\{|(z_1, z_2, z_3)| \leq \delta\}$, by Riemann extension theorem.

$\varphi_i(z_1, z_2, z_3)$ is bounded since each $z_{4,\nu}$ has the absolute value less than $\max\{|\pi^{-1}(z_1, z_2, z_3)| \in \bar{D}\} < \infty$, where $|(z_1, z_2, z_3)| \leq \delta$, and $\bar{D} = \pi^{-1}\{(z_1, z_2, z_3) ; |(z_1, z_2, z_3)| \leq \delta\}$ is bounded. We may then set

$$F(z_1, z_2, z_3, z_4) = z_4^d + P_1(\varphi_1(z_1 \cdot) \cdots \varphi_d(z_1 \cdot \cdot))\, z_4^{d-1} + \cdots + P_d(\varphi_1(\ ) \cdots \varphi_d(\ ))$$

a polynomial in z_1, z_2, z_3 whose roots are for fixed $z_3 \neq 0$ just the points $(z_1, z_2, z_3, z_{4,\nu}(z_1, z_2, z_3))$, and which is holomorphic in $\{|(z_1, z_2, z_3)| \leq \delta, \ |z_4| \leq \epsilon\}$. The divisor of F is $\bar{D}$, and we are done. Q.E.D.

Now we come to the proof of the proper mapping the-