Date 93. 6. 25

be a single valued function $\log^* z$ s.t $e^{\log^* z} = z$, for all nonzero complex numbers z.

First, since dg/g has a single pole with residue $\mathrm{ord}_{q_i}(g)$ at each q_i, we have by the residue theorem

$$\int_{\partial\Delta'} \varphi = 2\pi\sqrt{-1} \sum_{q_i} \mathrm{Res}_{q_i}(\varphi)$$

$$= 2\pi\sqrt{-1} \sum_{q_i} \mathrm{ord}_{q_i}(g) \cdot \log f(q_i).$$

Now, for points $p \in \delta_i$, $p' \in \delta_i^{-1}$ on $\partial\Delta'$ identified on S,

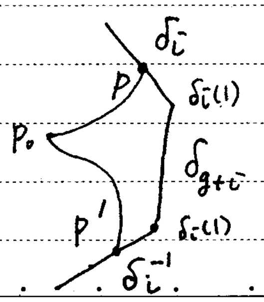
$$\log f(p') = \log f(p) + \int_{\delta_{g+i}} d\log f,$$

and so

$$\int_{\delta_i + \delta_i^{-1}} \varphi = \left(\int_{\delta_i} d\log g\right)\left(-\int_{\delta_{g+i}} d\log f\right)$$

and similarly

$$\int_{\delta_{g+i} + \delta_{g+i}^{-1}} \varphi = \left(\int_{\delta_{g+i}} d\log g\right)\left(\int_{\delta_i} d\log f\right).$$



$d\log f$ is holomorphic in Δ'

$$\Rightarrow \int_{p_0}^{p} d\log f + \int_{p}^{\delta_i(1)} d\log f + \int_{\delta_{g+i}} d\log f + \int_{\delta_i(1)}^{p'} d\log f + \int_{p'}^{p_0} d\log f = 0.$$