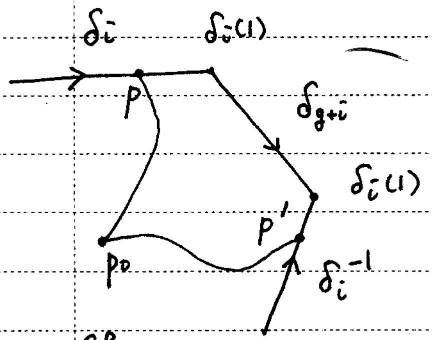
$$\pi(p') - \pi(p) = \int_p^{p'} \omega = \int_p^{\delta_i(1)} \omega + \int_{\delta_{g+i}} \omega + \int_{\delta_i(1)}^{p'} \omega$$

$= \int_{\delta_{g+i}} \omega = \Pi^{g+i}$ and similarly for $p \in \delta_{g+i}$, $p' \in \delta_{g+i}^{-1}$ identified on $S$, $\pi(p') - \pi(p) = -\Pi^{i}$.

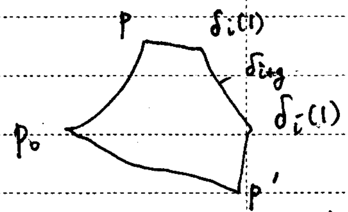



$p_0 \in \Delta$

$\pi(p) = \int_{p_0}^{p} \omega$ is the right definition.

$$\pi(p') - \pi(p) = \int_p^{p'} \omega = \int_p^{\delta_i(1)} \omega + \int_{\delta_{g+i}} \omega + \int_{\delta_i(1)}^{p'} \omega = \int_{\delta_{g+i}} \omega = \Pi^{g+i}$$

$p_0 \to p \xrightarrow{\text{along } \delta_i} \delta_i(1) \xrightarrow{\text{along } \delta_{g+i}} \delta_i(1) \xrightarrow{\text{along } \delta_i^{-1}} p' \to p_0 \Rightarrow \int_{p_0}^{p_0} \omega = 0$. since




is simply connected.

$$\int_{p_0}^{p} \omega - \int_{p_0}^{p'} \omega + \int_p^{\delta_i(1)} \omega + \int_{\delta_{g+i}} \omega + \int_{\delta_i(1)}^{p'} \omega = 0$$

Consider the meromorphic 1-form $\pi \cdot \eta$ in $\bar{\Delta}$. By the residue theorem, since $\eta$ has only first order poles,

$$\int_{\partial\Delta} \pi\cdot\eta = 2\pi\sqrt{-1} \sum_{\lambda} \mathrm{Res}_{s_\lambda}(\pi\cdot\eta)$$
$$= 2\pi\sqrt{-1} \sum_{\lambda} \mathrm{Res}_{s_\lambda}(\eta) \cdot \int_{s_0}^{s_\lambda} \omega .$$