In intrinsic terms, the Jacobian variety $\mathcal{J}(S) = V(S)/\Lambda(S)$, where $V(S) = H^0(S, \Omega^1)^*$ and the lattice $\Lambda(S) \cong H_1(S, \mathbb{Z})$ is embedded in $V(S)$ by integration.

「'More on Riemann Conditions'
It is just to prove that an integral invariant 2-form is (1,1) type and positive. $\Rightarrow$ Given $\omega = \frac{1}{2}\sum q_{ij}\, dx_i \wedge dx_j$, find conditions of Q and Ω or the normalized period matrix Ω.

$$\begin{array}{ccc} H_1(S, \mathbb{Z}) & \longrightarrow & V(S) = H^0(S, \Omega^1)^* \\ \delta & \longmapsto & \int_\delta(\ ) \end{array}$$

Let $L_i \in H^0(S, \Omega^1)^*$ s.t $L_i(\omega_j) = \delta_{ij}$, where $\{\omega_1, \cdots \omega_g\}$ is a basis for $H^0(S, \Omega^1)$.

$\Rightarrow$ $\int_\delta(\ ) = a_i L_i \Leftrightarrow (a_1, \cdots a_n) \Leftrightarrow \delta = a_i \delta_i$.

where $\int_{\delta_i} \omega_j = \delta_{ij}$.
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The polarizing form $\omega \in H^2(\mathcal{J}(S), \mathbb{Z}) \cong \mathrm{Hom}_{\mathbb{Z}}(\Lambda^2 H_1(S,\mathbb{Z}), \mathbb{Z})$ is the skew-symmetric bilinear form

$$Q : H_1(S, \mathbb{Z}) \otimes_{\mathbb{Z}} H_1(S, \mathbb{Z}) \longrightarrow \mathbb{Z}$$