Thm. (Abel): $\mathbb{C}/\Lambda$, $\Lambda = \mathbb{Z}\omega_1 \oplus \mathbb{Z}\omega_2$, $\mathrm{rk}_{\mathbb{R}}\Lambda = 2$.
$\exists\, f: \mathbb{C}/\Lambda \to \mathbb{P}^1$ mero. with zeros $[a_j] \in \mathbb{C}/\Lambda$ of order N_j and poles $[b_j]$ of order M_j $\Leftrightarrow$
$\Leftrightarrow$ $\sum N_j \overset{(1)}{=} \sum M_j$, $\sum N_j [a_j] \overset{(2)}{=} \sum M_j [b_j]$.
$\hookrightarrow$ on the torus

Proof: $\Theta(z) = \sum_{m\in\mathbb{Z}} \exp(\pi i m^2 \tau)\exp(2\pi i m z)$, $\tau = \omega_2/\omega_1$, $\mathrm{Im}\,\tau > 0$. Θ has exactly 1 zero in a fundamental domain for $\mathbb{C}/\Lambda$. $\Theta_\sigma(z) := \sum_{m\in\mathbb{Z}} \exp(\pi i (m+1/2)^2\tau)\exp(2\pi i(m+1/2)(z+1/2))$.
$\Theta_\sigma(z) = \exp(\pi i \tau/4 + \pi i (z+1/2))\,\Theta(z + (\tau+1)/2) \Rightarrow$
$\Rightarrow$ zeros of Θ_σ are translates of zeros of Θ; in particular, Θ_σ has only one zero in the fund. domain.
$\Theta_\sigma(-z) = -\Theta_\sigma(z) \Rightarrow \Theta_\sigma(z)$ has a simple zero at 0;
so $\Theta(z)$ has a simple zero at $\frac{\tau+1}{2}$.
Set
$$g(z) = \frac{\prod_j (\Theta_\sigma(z-a_j))^{N_j}}{\prod_j (\Theta_\sigma(z-b_j))^{M_j}}.$$
We need g well def. on $\mathbb{C}/\Lambda$.

$\lambda = p\tau + q$, $e(\lambda, z) := \exp(\pi i \lambda - \pi i p^2 \tau - 2\pi i p (z + \frac{1+\tau}{2}))$.
$\Theta_\sigma(z+\lambda) = e(\lambda, z)\,\Theta_\sigma(z)$. So
$$g(z+\lambda) = g(z)\cdot \frac{\prod_j e(\lambda, z-a_j)^{N_j}}{\prod_j e(\lambda, z-b_j)^{M_j}} \overset{(1)}{=} g(z)\,\frac{\exp(2\pi i \sum_j N_j a_j)}{\exp(2\pi i \sum_j M_j b_j)}.$$
Choose a_j, b_j s.t. this is just $g(z)$. $\square$

C cpt Riemann surface, $p \in C$, $AJ_p : C \to \mathrm{Jac}(C) = \mathbb{C}^g/\Lambda$.
$\sum_j N_j a_j$, $\sum_j M_j b_j$ divisors on C s.t. $\sum_j N_j = \sum_j M_j$.
$\sum_j N_j AJ(a_j) = \sum_j M_j AJ(b_j)$. $AJ: \mathrm{Div}^0(C) \to \mathrm{Jac}(C)$,
$\mathrm{Ker}(AJ) = \{\mathrm{div}(f),\ f \text{ mero.}\} \rightsquigarrow AJ: \frac{\mathrm{Div}^0(C)}{\mathrm{Div}(\text{mero.})} \hookrightarrow \mathrm{Jac}(C)$.
It is also surj..