LOCAL COORDINATES ON MODULAR CURVES (FIGURES)

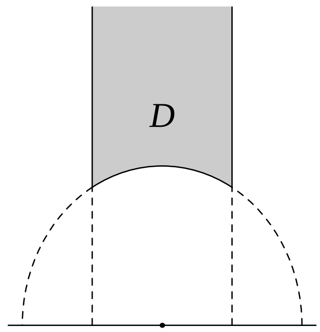

Figure 1. The fundamental domain for $\mathrm{SL}_2(\mathbb{Z})$

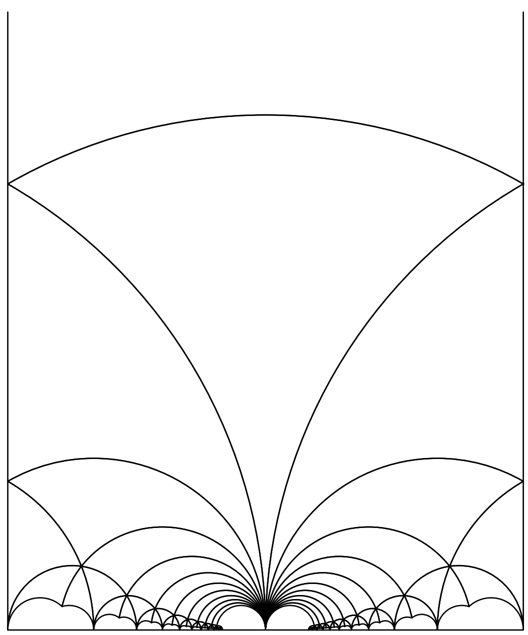

Figure 2. Some $\mathrm{SL}_2(\mathbb{Z})$-translates of $\mathcal{D}$

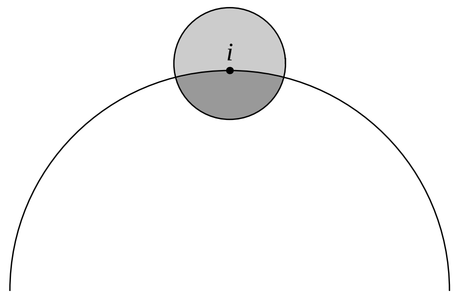

FIGURE 3. Pairwise equivalence about i

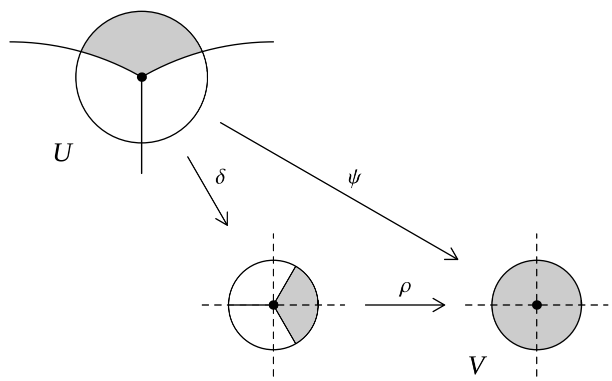

FIGURE 4. Local coordinates at an elliptic point

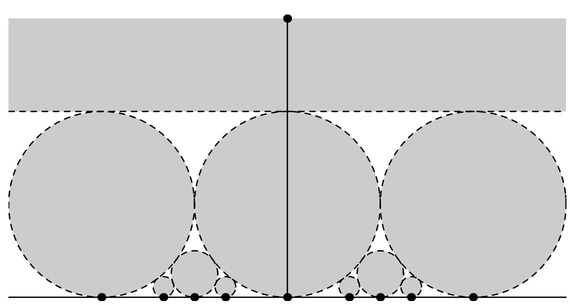

FIGURE 5. Neighborhoods of ∞ and of some rational points

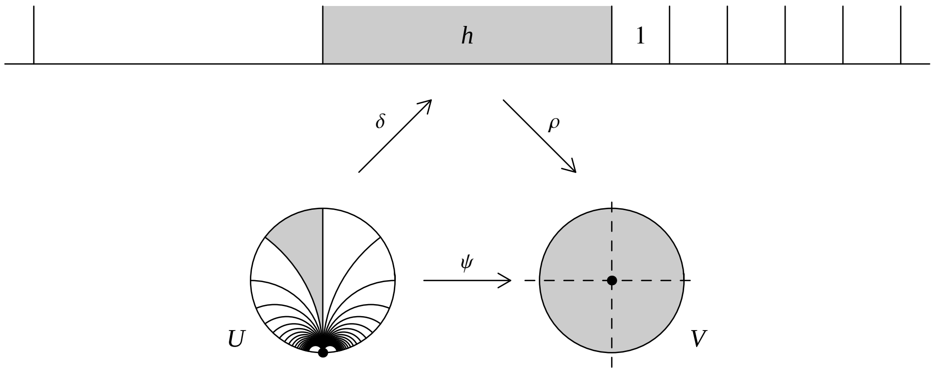

Figure 6. Local coordinates at a cusp

<table>
<tr><td colspan="2">$\pi : \mathcal{H}^* \longrightarrow X(\Gamma)$ is natural projection.
$U \subset \mathcal{H}^*$ is a neighborhood containing at most one elliptic point or cusp.
The local coordinate $\varphi : \pi(U) \xrightarrow{\sim} V$ satisfies $\varphi \circ \pi = \psi$
where $\psi : U \longrightarrow V$ is a composition $\psi = \rho \circ \delta$.</td></tr>
<tr><td>About $\tau_0 \in \mathcal{H}$:</td><td>About $s \in \mathbb{Q} \cup \{\infty\}$:</td></tr>
<tr><td>The straightening map is $z = \delta(\tau)$
where $\delta = \begin{bmatrix} 1 & -\tau_0 \\ 1 & -\overline{\tau}_0 \end{bmatrix}$, $\delta(\tau_0) = 0$.
$\delta(U)$ is a neighborhood of 0 in $\mathbb{C}$.</td><td>The straightening map is $z = \delta(\tau)$
where $\delta \in \mathrm{SL}_2(\mathbb{Z})$, $\delta(s) = \infty$.
$\delta(U)$ is a neighborhood of ∞ in $\mathcal{H}^*$.</td></tr>
<tr><td>The wrapping map is $q = \rho(z)$
where $\rho(z) = z^h$, $\rho(0) = 0$
with period $h = |\{\pm I\}\Gamma_{\tau_0}/\{\pm I\}|$.
$V = \rho(\delta(U))$ is a neighborhood of 0.</td><td>The wrapping map is $q = \rho(z)$
where $\rho(z) = e^{2\pi i z/h}$, $\rho(\infty) = 0$
with width $h = |\mathrm{SL}_2(\mathbb{Z})_s/\{\pm I\}\Gamma_s|$.
$V = \rho(\delta(U))$ is a neighborhood of 0.</td></tr>
</table>

Figure 7. Local coordinates on $X(\Gamma)$

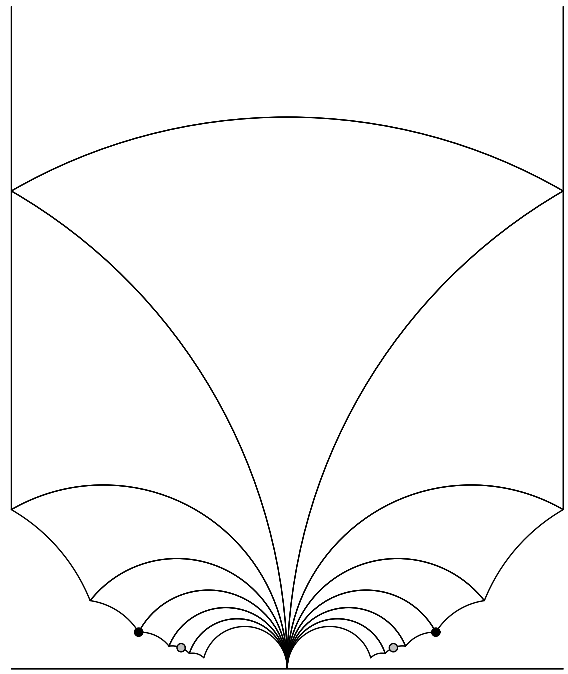

Figure 8. Fundamental domain for $\Gamma_0(13)$