

Notations.

- (i) \mathbf{Q} : the field of rational numbers; $\overline{\mathbf{Q}}$: its algebraic closure.
 \mathbf{R} : the field of real numbers; \mathbf{C} : the field of complex numbers;
 $\operatorname{Re}, \operatorname{Im}$: the real and the imaginary parts.

- (ii) \mathbf{Z} : the ring of rational integers.
 $\mathbf{Z}^{(p)} = \bigcup_{n=0}^{\infty} \frac{1}{p^n} \mathbf{Z}$, where p is a prime number.

- (iii) k_p : a p -adic number field; \mathcal{O}_p : the ring of integers of k_p ;
 \mathfrak{p} : the maximal ideal of \mathcal{O}_p ; \mathcal{U}_p : the multiplicative group $\mathcal{O}_p - \mathfrak{p}$;
 $q = N\mathfrak{p} = (\mathcal{O}_p : \mathfrak{p})$; ord_p : the normalized additive valuation of k_p .
 \mathbf{Q}_p : the p -adic number field; \mathbf{Z}_p : the ring of integers of \mathbf{Q}_p .

- (iv) $G_{\mathbf{R}} = PSL_2(\mathbf{R})$, $G_p = PSL_2(k_p)$; $PSL_2 = SL_2 / \pm 1$, $PL_2 = GL_2 / \text{center}$;
 $G = G_{\mathbf{R}} \times G_p$. If $S \subset G$ (subset), $S_{\mathbf{R}}, S_p$ are set-theoretical projections of S to $G_{\mathbf{R}}, G_p$, respectively.

- (v) \mathfrak{H} : the complex upper half plane, $G_{\mathbf{R}} = \operatorname{Aut}(\mathfrak{H})$ by Chapter 1, §3.

- (vi) If $K \supset k$ are fields, then $\operatorname{Aut} K$, $\operatorname{Aut}_k K$ are the automorphism groups of K , or the automorphism groups of K over k , respectively. If $\sigma \in \operatorname{Aut} K$, $\sigma|_k$ is its restriction to k . K^\times is the multiplicative group $K - \{0\}$.

- (vii) If L is a G_p -field over \mathbf{C} , then Σ is the set of all non-trivial non-equivalent discrete valuations of L over \mathbf{C} , considered as a complex manifold (see Chapter 2).

- (viii) If Γ is a group, then 1 or $I \in \Gamma$ denotes the identity element of Γ ; if $\gamma \in \Gamma$, then $\operatorname{Int}(\gamma)$ is the inner automorphism $x \mapsto \gamma^{-1}x\gamma$ of Γ ; $\{\gamma\}_{\Gamma}$ is the Γ -conjugacy class containing γ . If $\Gamma^0 \subset \Gamma$, then $\mathcal{H}(\Gamma, \Gamma^0)$ is the Hecke ring with respect to the left Γ^0 -coset decomposition of Γ (if it is defined).

- (ix) Finally, if S is a set, $|S|$ or $\#(S)$ denotes its cardinality.