A2

Remarks

$S_{3/2}(4N,\chi)$ = ON-compl. in $M_{3/2}^{\text{cusp}}(4N,\chi)$ of Eisenst. cusp forms

triv. cusp form: $\sum_n \psi(n)\, n q^{n^2}$, ψ odd prim. char.

$M_{3/2}^{\text{triv}}$ = Eisenstein + trivial cusp forms

— Fund. dom. & $\alpha(D)$ is finite

(e.g. $p,q = \infty, 0$: $\frac{1}{2}(\text{sign}\, Q(\infty) - \text{sign}\, Q(0)) \neq 0$
$\iff ac < 0$
$4ND = b^2 - 4ac = b^2 + 4|ac|$)

— L_f uniquely determined by these formulas

— $F = L_f(\sum_i c(p)\, e_p)$, then for $D \notin \mathbb{N}^2 \cdot \square$

~~$a_F(D) = \sum_{Q \in F_N(4ND)}$~~

$$L_f\left(\sum c(p)\, Q_p\right) = \sum_{4ND \neq \square} q^{Nb^2 - 4ac}\ \frac{1}{2} \sum_i c([r:s])\ \text{sign}(a r^2 + 2Nbrs + cs^2)$$

$$+ \sum_{4ND = \square} \cdots .$$

$M(N) = C(\ell_1, Q)^{*} \cap (\gcd(\cdot, N) = 1 \ldots)$

$$C(N,\chi) := \ker\left(\left[\mathbb{Z}[\mathbb{P}^1(\mathbb{Q})]^0 \otimes C(\bar{\chi})\right]_{\Gamma_0(N)} \longrightarrow {}^{N\mathbb{Z}} \mathbb{Z}_{\chi} \right).$$

$\mathbb{C}(\bar{\chi})$: $M(N)$-module $\left(\begin{smallmatrix} a & b \\ c & d\end{smallmatrix}\right), z \to \bar{\chi}(a) z$

$$T(\ell)(D) = \sum_{M \in \Gamma_0(N) \backslash G_\ell(N),\ \det = \ell} [M \cdot D]$$