A1

<u>Thm</u> For $p, q \in \mathbb{P}^1(\mathbb{Q})$ and squarefree $t > 0$ set

$$f_{p,q,t} := \sum_{D \geq 0} q^D \, a(D),$$

where for $D \neq A\square$ $(A\,\square = 4Nt)$

$$a(D) = \sum_{\substack{Q = [a,b,c] \\ N \mid a,\, 2N \mid b,\, b^2 - 4ac = 4Nt D}} \underbrace{\alpha\left(\frac{a}{N}\right)\left(\frac{-4N/t}{a/N}\right)}_{\square\text{-free}} \left.\begin{matrix}\alpha_t(Q) \\ \frac{1}{2}\left(\operatorname{sig} Q(p) - \operatorname{sig} Q(q)\right)\end{matrix}\right.$$

$=: F_N(4NtD)$

and for $D = A\,\square$

$a(D) =$ same with $\cancel{a \neq 0}$ $Q(p)\,Q(q) \neq 0$

$$- 2 \sum_{\substack{M \cdot Q \in F_N(4Nt D)^* \\ Q = [a,b,0] \\ 0 \leq a < 4N^2 t / |M|^2}} \alpha_t(\cancel{Q^{M^{-1}}}\ M\cdot Q)\, \mathbb{B}_1\left(\frac{a}{4N^2 t/|M|^2}\right)$$

$\Leftrightarrow$ $R \in F_N(4Nt D)$, $R(q) = 0$, $0 \leq R(p) < 4N^2 t$

$$+ 2 \sum_{\substack{Q = [0,b,c] \\ 0 \leq c < 4N^2 t/|M|^2}} \underline{\qquad}$$

where $M \in GL(2,\mathbb{Q})$, $M \begin{matrix}\infty \\ 0\end{matrix} = \begin{matrix}p \\ q\end{matrix}$

$Q^M = M^{-1}Q = Q(M\,x)$

$\cancel{M^{-1}R(0) = 0}$

$R(M0) = 0$

$R(M^{-1}\binom{0}{1})$

* Thm (1) $f_{p,q,t} \in M_{3/2}(4N, X)$

(2) For each $\square$-free $t > 0$ there is a ~~Hecke-~~ Hecke equiv. map (w.r.t. $T(\ell)$, $\gcd(\ell, 2N) = 1$) ~~and the~~

$$L_t : C(2N, X^2) \to S_{3/2}(4N, X) \text{ s.t. }$$

$$L_t\left(\sum c(p,q)\,(\mathbb{Q}_p - \mathbb{Q}_q)\right) \equiv \sum c(p,q)\, f_{p,q,t} \bmod M_{3/2}^{\text{triv}}(4N, X)$$

(3) $\sum_{t\ \square\text{-f}} \operatorname{Im} L_t = S_{3/2}(4N, X)$.

$\cancel{a}\ \|M\|^2$	
p_1	q_1
p_2	q_2

$q_2\ -q_1$

$-p_2\ p_1$

$M^{-1} R^* 0 = 0$

$R\, M0 = 0$

$M^{-1} R\, \infty$

$R\, M\infty$