## §4. Generaly MF of wght wt

**Example**: $\Gamma = \Gamma_0(11)$

$$S_2(11) = \mathbb{C}\,\eta(z)^2\,\eta(11z)^2$$

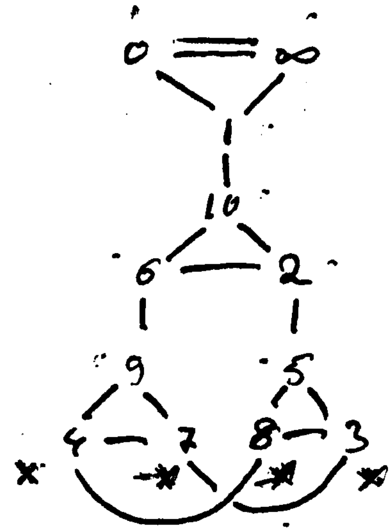
$$\Gamma_0(11)\backslash SL(2,\mathbb{Z}) \simeq \mathbb{P}^1(\mathbb{F}_{11}) = \mathbb{F}_{11} \cup \infty$$

$$\begin{pmatrix} * & * \\ c & d \end{pmatrix} \longleftrightarrow [c:d] \bmod 11$$

$$[a:1] \longleftrightarrow a$$
$$[1:0] \longleftrightarrow \infty$$

action of $SL(2,\mathbb{Z})$: $\quad a S = \frac{-1}{a} \qquad a ST = \frac{1}{1-a}$

Involution: $\quad a \mapsto -a$




red $\Delta$'s : $\langle ST \rangle$-orbits

blue 2-angles : $\langle S \rangle$-orbits

$M^- = \mathbb{C}\cdot\lambda$, where

$$\lambda(a) = \begin{cases} 1 & \text{for } a = 3, 4 \\ -1 & \text{for } a = -3, -4 \\ 0 & \text{otherwise} \end{cases}$$

$\eta(z)^2\eta(11z)^2$

$$= \sum (T(l)\lambda)([3:1])\, q^\ell$$

Ex Make this fmla more explicit using (1).

**Hence** $\quad M^- = \mathbb{C}\cdot\lambda$, where

$$\lambda\big((s) - (\infty)\big) = \#\{k \mid q_k \equiv \tfrac{3}{4} q_{k-1}\} - \#\{k \mid q_k \equiv \tfrac{-3}{-4} q_{k-1}\}$$

$\left( \infty = \frac{1}{0} = \frac{p_0}{q_0}, \frac{p_1}{q_1}, \ldots, \frac{p_n}{q_n} = s \right.$ : convergents of c.f. expansion of $s$ $\left.\right)$

$$\eta(z)^2\eta(11z)^2 = \sum_{\ell \geq 1} \lambda\left(T(\ell)\left[\left(\tfrac{1}{3}\right) - (0)\right]\right) q^\ell$$

$$= \sum_{\ell \geq 1} \left( \sum_{d \mid \ell} \sum_{b=0}^{d-1} \left[ \lambda\left(\left(\frac{\ell}{3d^2} + \frac{b}{d}\right) - (\infty)\right) - \lambda\left(\left(\frac{b}{d}\right) - (\infty)\right) \right] \right) q^\ell$$

→ goto (10)