① Kolloquium: Bielefeld, 23.10.92

„Fourierkoeffizienten von Modul- und Jacobiformen“

Modulformen

1) $G_4(\tau) = \sum_{n=0}^{\infty} \sigma_3(n) q^n$ ($\sigma_3(n) = \sum_{d \mid n} d^3 \underset{n=0}{=} \frac{1}{2}\zeta(-3) = \frac{1}{240}$, $q = e^{2\pi i \tau}$)

$\in M_k(\Gamma) = \{ f : \mathfrak{H} \xrightarrow{hol} \mathbb{C} \mid$ 1) $f\left(\frac{a\tau+b}{c\tau+d}\right)(c\tau+d)^{-k} = f(\tau)$ $\forall \begin{pmatrix} a & b \\ c & d \end{pmatrix} \in \Gamma$ ($\tau \in \mathfrak{H}$ = ob. Halbebene) 2) $\cancel{H}$ " $= O(1)$ $\forall \begin{pmatrix} a & b \\ c & d \end{pmatrix} \in \Gamma_1$ $\}$

(hier $k=4$, $\Gamma = \Gamma_1 = SL(2,\mathbb{Z})$)

stets

1) $f \in M_k(\Gamma)$ hat FE $f(\tau) = \sum a_f(n) q_t^n$ ($t = t(\Gamma) \in \mathbb{N}$, $q_t = e^{2\pi i \tau / t}$)

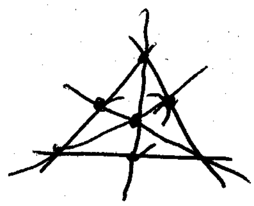
$\dim M_k(\Gamma) < \infty$.

2) $q\left(\sum_{1}^{\infty} p(n) q^n\right)^{-24}$ ($p(n)$ = # Part. von n)

$\in S_k(\Gamma)$ = -- wie $M_k(\Gamma)$, aber $o(1)$ statt $O(1)$ in 1)

(hier $k=12$, $\Gamma = \Gamma_1$)

3) $\mathbb{P}_2(\mathbb{F}_2)$



(Geraden) $\cup$ {Komplement der Geraden} $\cup$ $\{\emptyset\}$ $\cup$ $\{\mathbb{P}_2(\mathbb{F}_2)\}$

Erz VR$/\mathbb{F}_2$ (bzg. sym. Diff.)

$\xrightarrow{\hat{=}} H \subseteq \mathbb{F}_2^7$

$\Gamma = \{ x \in \mathbb{Z}^8 \mid (x_1, \dots, x_7) \bmod 2 \in H,\ \sum_{1}^{8} x_j \underset{2}{\equiv} 0 \}$,

dann $\sum q^{x^2/4} = 240\, G_4 \in M_4(\Gamma_1)$.