

Ideas at problems

①

- 1)  $G_r$  encodes a triangulation of  $X_r$ . Can we deduce from that  $d_{G_r} = \# \text{ asps} = 1 + 2g_{\text{gen}}(X_r)$ ?
- 2) We can identify subgrps of  $SL(2, \mathbb{Z})$  with primitive subgrps of  $S_n$  ( $n = [SL(2, \mathbb{Z}) : \Gamma]$ ) generated by  $t$ -elts  $s, r$  with  $s^2 = r^2, s^4 = 1$ . To what correspond Hecke operators?
- 3) What labels correspond to Eisenstein series.
- 4) What labels correspond to Eisenstein Hecke eigenform?

$M_g(N)$  in relation  
 §3  $M_g(N)$ ,  $(\text{Hecke})$  or  $M_g(N)$

The  $M_g(N) = \text{Eisenstein series}$  via Cohomology  
 New form  $\rightarrow$  Hecke eigenform  
 # number of Hecke eigenforms  $\leftarrow$   $X_g(N)$ , possibly  
 fields, via Galois invariants

Conclude MF represent residually Galois