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Conjugation in the Theory of Hecke Correspondence

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A Hecke correspondence is an association between entire modular (or automorphic) forms and Dirichlet series satisfying a prescribed functional equation. This association can be traced back to 1859 in a short memoir by Bernhard Riemann where he states the now-famous Riemann Hypothesis. There, he dealt with the Riemann Zeta function, the prototype for Dirichlet series, and the theta function, an entire modular form on the theta group. In the mid 1930's, Erich Hecke clarified the connection by way of the Mellin transform. He established a correspondence theorem between Dirichlet series satisfying a functional equation (and certain analytic conditions) and entire automorphic forms on the Hecke groups.

In this talk, we will use a variation of the Mellin transform to discuss a Hecke correspondence theorem on certain classes of conjugates (by real 2×2 matrices of determinant one) of the Hecke groups. The main result here is a generalization of Hecke's classic correspondence theorem. Furthermore, by computing generators of particular conjugates, we will see that generalized Hecke groups arise naturally. We close with a discreteness condition for these groups that extends Hecke's original result on the Hecke groups.

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