

Modular Forms Whose Fourier Coefficients Involve Zeta Functions of Binary Hermitian Forms

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Abstract

In 1975, Cohen generalized Hurwitz class number using Dirichlet's class number formula to a number $H(r, n)$ which is closely related to the value of a certain Dirichlet L -series at $1 - r$ and showed that for $r \geq 2$ the generating function $\sum_{n=0}^{\infty} H(r, n)q^n$ is a modular form of weight $r + 1/2$ on $\Gamma_0(4)$. In this talk, I will begin by describing Hurwitz class number and class number relations and then proceed to discuss Cohen's result. I will then discuss a family of modular forms on $\Gamma_0(N)$ which were constructed by Ueno in a similar way as Cohen's construction where the numbers $H(r, n)$ are replaced with zeta functions of binary Hermitian forms evaluated at integral arguments. Finally, I will discuss some preliminary results showing how Ueno's results can be used to get new formulas for the critical values of these zeta functions in terms of finite sums of twisted divisor sums.