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Special Identities for Theta Constants Associated with Z_n Curves

A nonsingular Z_n curve is an algebraic curve with equation $$w^n=\prod_{j=0}^{nr-2}(z-\lambda_j) r\geq 2, \lambda_j \neq \lambda_k for j \neq k$$. The associated compact Riemann surface has genus $g=\frac{(n-1)(nr-2)}{2}$ and if endowed with a canonical homology basis gives rise to theta functions. The Thomae formulae for such surfaces states that for a set of characteristics (points of order n on the associated Jacobian variety) certain powers of these theta constants divided by a polynomial in the λ_j 's is independent of the characteristic.

In today's talk I shall show how to invert this system of equations and obtain each λ_j as a quotient of a product of two of the theta constants.

We shall then show how this can be used to write down special identities for these theta constants.