1145-06-1114   **Jason R Elsinger***, jelsinger@flsouthern.edu. *Representations of Lattice Vertex Algebras, Trace Functions, and Modular Transformations: Examples in order 3.*

Every isometry σ of a positive-definite even lattice Q can be lifted to an automorphism of the lattice vertex algebra V_Q. An important problem in vertex algebra theory and conformal field theory is to classify the representations of the σ-invariant subalgebra V_Q^σ of V_Q, known as an orbifold. Under certain assumptions, all irreducible V^σ-modules are obtained by restriction from twisted or untwisted V-modules, proved in a series of papers by M. Miyamoto. Previously we have described explicitly the orbifold modules in the case when σ is an isometry of Q of order two. In our study of extending our work to prime order, we have worked out several examples in the case when σ has order 3. Here we show how we define trace functions on the irreducible V_Q-modules to achieve tranformations laws for the characters of irreducible V_Q^σ-modules. The example where Q is the root lattice D_4 and σ is the permutation which fixes the central node in the Dynkin diagram will be discussed in detail. We also discuss the S-matrix and T-matrix describing the modular group in this case. (Received September 19, 2018)