1056-16-1814 **Colleen Duffy*** (`duffycm@uwec.edu`), University of Wisconsin - Eau Claire, Department of Mathematics - Hibbard Hall, Eau Claire, WI 54701. *Action of the symmetry group of the n-dimensional hypercube on the algebra associated to the Hasse graph of the n-cube.* Preliminary report.

It is interesting to study the structure of (graded) algebras associated to directed graphs. There is an algebra $A(\Gamma_{\{4,3^{n-2}\}})$ associated to the directed Hasse graph $\Gamma_{\{4,3^{n-2}\}}$ of the n-dimensional hypercube. Let E be the set of edges in the graph and let $P_\pi(t) = (1-te_1)\cdots(1-te_m)$ for any directed path $\pi = \{e_1, ..., e_m : e_i \in E\}$ in $\Gamma_{\{4,3^{n-2}\}}$. Then $A(\Gamma_{\{4,3^{n-2}\}})$ is the quotient of the free algebra $T(E)$ by the relations given by $P_{\pi_1}(t) = P_{\pi_2}(t)$ where π_1 and π_2 have the same initial and final vertices. The symmetry group of the n-dimensional hypercube, which is the Coxeter group $[4, 3^{n-2}]$, acts naturally on $\Gamma_{\{4,3^{n-2}\}}$, and so on each of the homogeneous subspaces $A(\Gamma_{\{4,3^{n-2}\}})_{[i]}$ of $A(\Gamma_{\{4,3^{n-2}\}})$. For each element $(\sigma, \vec{a})$ in the Coxeter group, we find the graded trace function $\mathrm{Tr}_{(\sigma,\vec{a})} = \sum_{i\geq 0} \mathrm{Tr}_{(\sigma,\vec{a})}|_{A(\Gamma_{\{4,3^{n-2}\}})_{[i]}} t^i$. We use these graded trace generating functions to obtain the multiplicities of the irreducible $[4, 3^{n-2}]$-modules in $A(\Gamma_{\{4,3^{n-2}\}})_{[i]}$. (Received September 22, 2009)