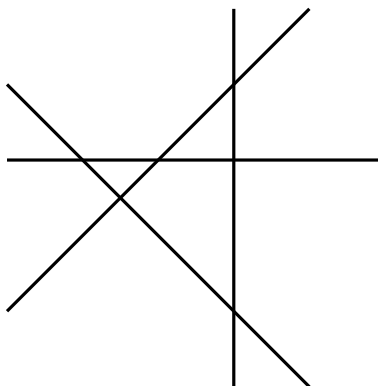


WARTHOG 2017

The quiver presentation

Exercises

Consider the hyperplane arrangement shown below (which corresponds to $K = \{\text{diag}(a_1, \dots, a_4) \mid a_1 a_3 a_4 = 1 = a_2 a_3 a_4^{-1}\}$):



Pick a direction to serve as the height function for category $\mathcal{O}$ (make sure it's generic).

1. Pick a generic integral central character (it would be nice if it reproduced the picture above, but not a huge deal if it doesn't) and write down a list of weights such that L^λ give an irredundant list of the simples in category $\mathcal{O}$ with integral weights.
2. Write a presentation of the endomorphisms of the projectives in category $\mathcal{O}$.
3. Find the multiplicities of simple modules in Verma modules for as many Vermas as you have patience for, and similarly with the multiplicities of Verma modules in projectives.