Lie Groups and Representations, Spring 2016
Problem Set 5

Due Monday, February 29

Problem 1: Prove Frobenius reciprocity

$$Hom_G(V, Ind_H^G(W)) = Hom_H(V_{|H}, W)$$

for H a closed subgroup of a Lie group G, W a representation of H, V a representation of G.

Problem 2: Adapt the Borel-Weil (holomorphic induction) constructions given

in chapters 11 and 14 of Graeme Segal's *Lectures on Lie groups and Lie algebras* to the case of $SL(n, \mathbf{C})$ (i.e. give a detailed construction of the irreducible representations corresponding to $k\omega_1$ and $\omega_2, \cdots \omega_{n-1}$ as holomorphic functions on the group).