Groups and Representations I: Problem Set 1

Due Monday, September 24

Problem 1: Prove that the classical compact groups $SO(n)$ and $SU(n)$ are compact and connected.

Problem 2: Show that $SU(n)/SU(n-1) = S^{2n-1}$.

Problem 3: Show that $Sp(n)$, defined as $Sp(n, \mathbf{C}) \bigcap U(2n)$ is isomorphic to the subgroup of $GL(n, \mathbf{H})$ preserving the standard quaternionic norm.

Problem 4: Knapp, problem 7 of Introduction, page 21.

Problem 5: Knapp, problem 8 of Introduction, page 21.

Problem 6: Knapp, problem 9 of Introduction, page 21.