Assignment-4

1. Prove that $U(n)$ and $SU(n)$ are path connected.

(1)

2. Let G be a Lie group, $\mathcal{G} = Lie(G)$ and $\rho: G \to GL(V)$ a representation (smooth) of G. Then $d\rho: \mathcal{G} \to \mathfrak{gl}(V)$ is a representation of $\mathcal{G}$. Suppose $v \in V$ is such that $\rho(g) \cdot v = v \ \forall \ g \in G$. Prove that $d\rho(X) \cdot v = 0 \ \forall \ X \in \mathcal{G}$.

(1).