NdT 12/12/20

Dual representation and weights

Set up: $\mathbb{K}$ is alg. closed of char. 0
$\mathfrak{g}$ is a f.d. s.s. Lie alg.
$\mathfrak{h}$ is a maximal toral subalg. of $\mathfrak{g}$.
V is a finite dim. rep. of $\mathfrak{g}$ whose set of weights we denote Π.

Show that the set of weights of the rep. of $\mathfrak{g}$ dual to V is $\{-\lambda, \lambda \in \Pi\}$.

Hint: Consider a basis of V consisting of weight vectors. The elts of the dual basis are weight vectors of V^*.