

Math 108B - Home Work # 5

Due: Friday, May 16, 2008

1. LADR p. 159-160: Exercises 11, 13 (Hint: diagonalize), 15, 22.
2. Recall that if U is a subspace of the inner product space V , we defined the reflection in U to be the linear map $R_U : V \rightarrow V$ given by

$$R_U = 2P_U - I_V,$$

where P_U is the orthogonal projection onto U and I_V is the identity map. Show that any self-adjoint isometry $T : V \rightarrow V$ is a reflection in some subspace U of V . (Hint: U will turn out to be an eigenspace of T . So what are the possible eigenvalues of T ?)