Read Section 6.11 and answer the following questions.

1. How do we define a rotation on a 1-dimensional inner product space?

2. Let $V$ be a nonzero finite-dimensional real inner product space. Then there exists a collection of pairwise orthogonal $T$-invariant subspaces $\{W_1, \ldots, W_m\}$ such that

$$V = W_1 \oplus \cdots \oplus W_m.$$  

(a) What can you say about the dimension of each $W_i$?

(b) If you know $T_{W_i}$ is a reflection, what can you say about the dimension of $W_i$?

3. Prove that if $T$ is a reflection on a 2-dimensional inner product space then $T^2 = I$. 