MATH 101: GRADUATE LINEAR ALGEBRA DAILY HOMEWORK #11

Problem 11.1. Let V be an F-vector space, and let $\phi: V \to V$ be an F-linear map. We say that ϕ is an *involution* if $\phi^2 = 1$.

Suppose that V is an inner product space and let ϕ be an involution on V. Show that the following are equivalent:

- (a) ϕ is normal;
- (b) ϕ is unitary;
- (c) ϕ is self-adjoint; and
- (d) All singular values of ϕ are equal to 1.

Date: Assigned Wednesday, 4 October 2017; due Friday, 6 October 2017.