

Homework Set 8

Due Nov 17

Q1. Find all real 2×2 matrices that commute with

$$\begin{pmatrix} 1 & 1 \\ 0 & 1 \end{pmatrix}$$

Q2. A vector $x \in V$ is called cyclic for A if the span of $x, Ax, A^2x, \dots, A^{k-1}x$ is V for some k . Show that if dimension of V is n , then k has to be equal to n . Show that if A is diagonal A has a cyclic vector if and only if the diagonal entries are distinct, i.e. no two are equal.