Problem Set 11, Math 54-Lec 3, Linear Algebra, Fall 2017

October 2nd, 2017

Problem 1. Let $\vec{x}, \vec{y}$ be eigenvectors of a matrix A such that $\vec{x}$ and $\vec{y}$ correspond to the distinct (diffferent) eigenvalues λ_1 and λ_2, respectively. Prove that $\vec{x}, \vec{y}$ are linearly independent.

Problem 2. Let A be a 5×5 matrix with eigenvalues λ_1, λ_2. Furthermore, let the eigenspace of λ_1 be three-dimensional and let the eigenspace of λ_2 be two-dimensional. Is A diagonalizable?Justify your answer.