ITM429 - Quiz 2 - Fall 2019

Name (이름): ( )

#1. Consider the following 3×3 matrix A.

$$A = \begin{bmatrix} 4 & -1 & 6 \\ 2 & 1 & 6 \\ 2 & -1 & 8 \end{bmatrix}$$

(a) Find eigenvalues and corresponding eigenvectors. Following information may be useful.

$$det(A - \lambda I) = |A - \lambda I| = \begin{vmatrix} 4-\lambda & -1 & 6 \\ 2 & 1-\lambda & 6 \\ 2 & -1 & 8-\lambda \end{vmatrix} = -\lambda^3 + 13\lambda^2 - 40\lambda + 36 = -(\lambda - 2)(\lambda - 2)(\lambda - 9)$$

(b) **(This is optional and NOT counted for quiz score.)** Conduct diagonalization of A. That is, identify P and D for $A = PDP^{-1}$. Perform sanity check on this. If your P and D satisfy $A = PDP^{-1}$, then you know that your solution to (a) is correct.[1]

[1] P is a matrix whose columns are eigenvectors and D is a diagonal matrix whose diagonal entries are eigenvalues. Make sure that 'the pairs of eigenvalue and eigenvector are aligned to each other.