Quiz 7 For DIS 210 March 17. 2007 GSI : Baoping Liu

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Problem 1 : Find the characteristic equation (1 pt)

all the eigenvalues (1 pt) and the eigenvectors corresponds to each of the eigenvalue (3pt)

$$A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 2 \\ 0 & 2 & 4 \end{bmatrix}$$

Problem 2 : Quick Questions , Justify your answer

(1) True or False: the sum of 2 eigenvectors corresponds to different eigenvalue λ_1, λ_2 is also an eigenvector

(2) Can you find a 2×2 matrix that has no eigenvectors in $\mathbb{R}^2$
(Hint: does it have real eigenvalues?)

(3) True or False: every eigenvector of an invertible matrix A is also an eigenvector of A^{-1}

(4) (2pt) Find the change-of-coordinates matrix from $\mathcal{B} \to C$, and from $C \to \mathcal{B}$

$\mathcal{B} = \{1+t^2,\ t-1,\ (t-1)^2\}$

$C = \{1,\ t,\ t^2\}$