

Math 225 Quiz 4

Don't forget to write down clearly your **Name**:

and **Net ID**:

1. Multiple choices (4 points) Find out the correct answer.

(1). Which of the following statement is correct? Answer: _____.

- A. Any matrix in $M(2, \mathbb{R})$ is diagonalizable.
- B. Any matrix in $M(2, \mathbb{C})$ has two linearly independent eigenvectors in \mathbb{C}^2 .
- C. The characteristic polynomial of a matrix $A \in M(2, \mathbb{C})$ always has 2 distinct solutions.
- D. The characteristic polynomial of a matrix $A \in M(2, \mathbb{C})$ always splits.

(2). Which of the following statement is true about the matrix? Answer: _____.

$$A = \begin{pmatrix} 0 & 0 & -1 \\ 0 & -1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$$

- A. 0 is an eigenvalue for A .
- B. The vector $u = (2, 0, 0)^t$ is an eigenvector for A .
- C. 1 is an eigenvalue for A .
- D. The standard vector $v = (0, 0, 2)^t$ is an eigenvector for A .

2. Diagonalization (6 points). Is the matrix

$$A = \begin{pmatrix} 0 & 2 \\ -2 & 0 \end{pmatrix}$$

diagonalizable inside $M(2, \mathbb{C})$? If yes, diagonalize it by finding a invertible matrix B such that BAB^{-1} is diagonal; if no, explain why.