

1. 請框出答案. 2. 不可使用手機、計算器，禁止作弊!

1. Find all $a, b \in \mathbb{C}$ such that the matrix A is unitarily diagonalizable.

$$A = \begin{bmatrix} i & a \\ b & i \end{bmatrix}$$

Answer: $a = \underline{\hspace{1cm}}$, $b = \underline{\hspace{1cm}}$

Solution :

Check A is normal matrix and use the Theroem 9.7.

2. Please provide (**and explain**) a square matrix A that A is diagonalizable but NOT unitarily diagonalizable.

Solution :

example for Section 9.3 problem 19 (j).

3. Please provide (**and explain**) a square matrix B with all eigenvalues of algebraic multiplicity 1 and B is NOT unitarily diagonalizable.

Solution :

counterexample for Section 9.3 problem 19 (j).