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: $a =$＿＿ , $b =$＿＿

Solution：

Check A is normal matrix and use the Theroem 9.7.

Similar with example 6.

Quiz 14 應數一線性代數

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).