姓名: SOLUTION　　葉均承　　應數一線性代數

學號: _____　　**Quiz 6**　　考試日期: 2023/03/28

1. 請框出答案. 2. 不可使用手機、計算器，禁止作弊!

1. Find an orthogonal diagonalization of the matrix A, that is, find an orthogonal matrix C such that $C^{-1}AC$ is a diagonal matrix D.

$$A = \begin{bmatrix} 3 & -1 & 0 \\ -1 & 3 & 0 \\ 0 & 0 & 2 \end{bmatrix}$$

Answer: $C=$ $\begin{bmatrix} -1/\sqrt{2} & 1/\sqrt{2} & 0 \\ 1/\sqrt{2} & 1/\sqrt{2} & 0 \\ 0 & 0 & 1 \end{bmatrix}$, $D=$ $\begin{bmatrix} 4 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 2 \end{bmatrix}$

2. Show that the real eigenvalues of an orthogonal matrix must be equal to 1 or -1. [HINT: Think in terms of linear transformation]

Solution：

Section 6-3 #27.