Lecture 24 Problems: Problem

(a): Solving

$$\det(A - \lambda I) = 0 \Rightarrow (1 - \lambda)^2 = b^2$$

$$1 - \lambda = b,$$

let $b = 2$; then $\lambda = -1$ and so on.

(b): The eigenvalues have the same signas the pivots.

(c): Because then they'd be the same.

Problem 2:

A is invertible, orthogonal, permutation, and Markov, and can be factored as QR, $S\Lambda S^{-1}$, and $Q\Lambda Q^T$.

B is a projection, diagonalizable, and Markov, and can be factored as LU, $S\Lambda S^{-1}$, and $Q\Lambda Q^T$.

Problem 3

$$A = \begin{bmatrix} 0.7 & 0.1 & 0.2 \\ 0.1 & 0.6 & 0.3 \\ 0.2 & 0.3 & 0.5 \end{bmatrix}$$

Since $\lambda = 1$, then

$(A - I)x = 0 \Rightarrow$ ~~$Ax = Ix$~~ is also $x = \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$