

Instructions: Clearly answer each of the questions below. Remember to check the back side. Show your work and any formulas you employ. Simplify all answers as far as possible.

1. (1 pt) The equation $\det(A - \lambda I) = 0$ is called the Characteristic equation

2. (1 pt) Is $[-2, 1]$ an eigenvector of the matrix $\begin{bmatrix} 0 & 1 \\ -1 & 2 \end{bmatrix}$? No

$$\begin{bmatrix} 0 & 1 \\ -1 & 2 \end{bmatrix} \begin{bmatrix} -2 \\ 1 \end{bmatrix} = \begin{bmatrix} 1 \\ 4 \end{bmatrix}, \text{ which is not a rescaling of } [-2, 1].$$

3. (2 pts) What are the eigenvalues of the matrix $\begin{bmatrix} 1 & 2 & 0 \\ 0 & 3 & 1 \end{bmatrix}$? Matrix is not square!

4. (2 pts) What are the eigenvalues of the matrix $\begin{bmatrix} 6 & 7 & 1 \\ 0 & 0 & 7 \\ 0 & 0 & 2 \end{bmatrix}$? $\lambda \in \{6, 0, 2\}$

5. (2 pts) What are the eigenvalues of the matrix $\begin{bmatrix} 2 & 4 \\ 4 & 5 \end{bmatrix}$? $\lambda \in \frac{7 \pm \sqrt{73}}{2}$