

Math 2890 Homework 7 Due date: March 18

- (1) Problem 5 in Sec 2.9 (p 180)
- (2) Compute the determinant of the following matrices.
$$\begin{bmatrix} 3 & 2 & 4 \\ 2 & 3 & 2 \\ -1 & 5 & -1 \end{bmatrix}, \begin{bmatrix} 1 & 2 & 1 \\ -2 & -3 & 1 \\ -1 & -1 & 2 \end{bmatrix}.$$
- (3) Find the characteristic polynomial, eigenvalues and eigenvectors of the following matrices. $\begin{bmatrix} 3 & -2 \\ 1 & -1 \end{bmatrix}, \begin{bmatrix} 5 & 3 \\ 3 & 5 \end{bmatrix}.$
- (4) (a) Let $A = \begin{bmatrix} 4 & 0 & 1 \\ -2 & 1 & 0 \\ -2 & 0 & 1 \end{bmatrix}.$
Show that $\det(A - \lambda I) = (1 - \lambda)(2 - \lambda)(3 - \lambda).$
(b) Use the information above to find the eigenvalues and eigenvectors of $A.$
- (5) (a) Let $A = \begin{bmatrix} 0 & -4 & -6 \\ -1 & 0 & -3 \\ 1 & 2 & 5 \end{bmatrix}.$
Show that $\det(A - \lambda I) = (1 - \lambda)(2 - \lambda)^2.$
(b) Use the information above to find the eigenvalues and eigenvectors of $A.$