

HOMEWORK #10 (Chapter 8 Exercises--- Matrices)

Due on Jan. 4

- 1) Use either Gaussian elimination or Gauss-Jordan elimination to solve the given system

$$\begin{aligned}x_1 + \quad x_3 - x_4 &= 1 \\2x_2 + x_3 + x_4 &= 3 \\x_1 - x_2 + \quad x_4 &= -1 \\x_1 + x_2 + x_3 + x_4 &= 2\end{aligned} \quad (\text{page 362, Problem 17})$$

- 2) Find the rank of the given matrix

$$\begin{pmatrix} 0 & 2 & 4 & 2 & 2 \\ 4 & 1 & 0 & 5 & 1 \\ 2 & 1 & 2/3 & 3 & 1/3 \\ 6 & 6 & 6 & 12 & 0 \end{pmatrix} \quad (\text{page 367, Problem 9})$$

- 3) Evaluate the determinant of the given matrix by cofactor expansion

$$\begin{pmatrix} 4 & 5 & 3 \\ 1 & 2 & 3 \\ 1 & 2 & 3 \end{pmatrix} \quad (\text{page 373, Problem 19})$$

- 4) Find the inverse of the given matrix

$$\begin{pmatrix} 1 & 2 & 3 & 1 \\ -1 & 0 & 2 & 1 \\ 2 & 1 & -3 & 0 \\ 1 & 1 & 2 & 1 \end{pmatrix} \quad (\text{page 390, Problem 25})$$

- 5) Find the eigenvalues and eigenvectors of the given matrix

- a) (page 400, Problem 19)

$$\begin{pmatrix} 0 & 0 & -1 \\ 1 & 0 & 0 \\ 1 & 1 & -1 \end{pmatrix}$$

- b) (page 400, Problem 21)

$$\begin{pmatrix} 1 & 2 & 3 \\ 0 & 5 & 6 \\ 0 & 0 & -7 \end{pmatrix}$$