

MATH 1210 Assignment #5

Due: November 24 2008, In Class

NO LATE ASSIGNMENTS WILL BE ACCEPTED

Reminder: all assignments *must* be accompanied by an honesty declaration. This should be stapled to the FRONT of your assignment. Include your lab section.

Show all your work. Unjustified answers will receive little or no credit. Use single sided white $8\frac{1}{2} \times 11\frac{1}{2}$ paper, staple the top left corner.

1. Given that the matrix A is the coefficient matrix of a homogeneous system of equations, find all basic solutions.

$$A = \begin{bmatrix} 1 & 4 & 3 & 1 & -6 & 3 \\ 2 & 4 & 4 & 0 & -8 & 5 \\ 1 & 6 & 4 & 1 & -9 & 5 \end{bmatrix}$$

2. Find the determinant of the given matrix by the given method:

- (a) Expansion along the 2nd row (show all steps):

$$A = \begin{bmatrix} 1 & 4 & -6 \\ 2 & -8 & 5 \\ 1 & 6 & 4 \end{bmatrix}$$

- (b) Expansion along the 3rd column (Show all steps):

$$A = \begin{bmatrix} 3 & -1 & 2 \\ 1 & 2 & 1 \\ -1 & -3 & -4 \end{bmatrix}$$

- (c) Use row operations to reduce to an upper triangular matrix.

$$A = \begin{bmatrix} 0 & 3 & 9 \\ 5 & 10 & 25 \\ 0 & 2 & -5 \end{bmatrix}$$

3. Solve the following systems using **Cramers Rule**:

$$\begin{aligned} 4x_1 + 3x_2 + 2x_3 &= 6 \\ 2x_1 - 3x_2 + 5x_3 &= -10 \\ 4x_1 + 7x_2 + 8x_3 &= 22 \end{aligned}$$

4. Determine whether the given set of vectors is linearly dependent or linearly independent. Justify your answer.

- (a) $\{[1, 2], [3, 4], [5, 6]\}$

- (b) $\{[11, 22], [4, 44]\}$

- (c) $\{[1, -1, 1], [2, 5, 3], [4, 1, -6]\}$

- (d) $\{[3, 1, 3], [1, 2, 4], [6, 2, 6]\}$

- (e) $\{[1, -1, 1, -1], [2, 3, -1, 2], [3, 2, -1, 1]\}$