University of Guyana
Faculty of Technology

EMT 121 - Problem Set VII

March 29, 2011

1. Solve the given system of linear equations using Cramer's Rule.

$$-x_1 + x_2 + 2x_3 = 1$$
$$2x_1 + 3x_2 + x_3 = -2$$
$$5x_1 + 4x_2 + 2x_3 = 4$$

2. For the given system find x_2

$$6x_1 + x_2 - x_3 = 4$$
$$x_1 - x_2 + 5x_4 = -2$$
$$-x_1 + 3x_2 + x_3 = 2$$
$$x_1 + x_2 - x_3 + 2x_4 = 0$$

3. Find values of λ for which the given matrix is singular.
$A = \begin{pmatrix} 1-\lambda & 2 \\ 3 & 2-\lambda \end{pmatrix}$

4. Find the determinant of the following matrices

(a) $A = \begin{pmatrix} 2 & 1 & 3 & 4 & 2 \\ 6 & 2 & 1 & 4 & 1 \\ 6 & 3 & 9 & 12 & 6 \\ 2 & 1 & 3 & 4 & 1 \\ 1 & 4 & 2 & 1 & 1 \end{pmatrix}$

(b) $B = \begin{pmatrix} 2 & 0 & 0 & 0 & 0 \\ 6 & 2 & 0 & 0 & 0 \\ 1 & 2 & 3 & -3 & 0 \\ 0 & 1 & 2 & 3 & 0 \\ 1 & 4 & 2 & 1 & 1 \end{pmatrix}$

5. Use determinants to do the following:

   (a) Find the area of the triangle with vertices (1,2),(3,4) and (4,0).
   (b) Determine if the points (1,-1),(0,-4) and (2,2) are collinear.
   (c) Find the equation of the line passing through (2,4) and (-1,-2).