CONCORDIA UNIVERSITY

Department of Mathematics & Statistics

Course	Number	Section(s)
Mathematics	204	All Except EC
Examination	**Date**	**Pages**
Midterm	March 5, 2016	2
Instructors		**Course Examiner**
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Special Instructions

- ▷ Only approved calculators are allowed.
- ▷ Justify all your answers.
- ▷ All questions have equal value.

1. Using Gauss-Jordan method, find all solutions of the following system of equations:

$$\begin{aligned} x_1 - 7x_2 + 6x_4 &= 5 \\ x_3 - 2x_4 &= -3 \\ -x_1 + 7x_2 - 4x_3 + 2x_4 &= 7 \end{aligned}$$

2. Let $A = \begin{pmatrix} 1 & 0 & -2 \\ -3 & 1 & 4 \\ 2 & -3 & 4 \end{pmatrix}$.

   (a) Find A^{-1}.

   (b) If $AX = B = \begin{pmatrix} 1 & 0 \\ 0 & 1 \\ 1 & 2 \end{pmatrix}$, find X.

3. Calculate the determinant of the matrix $A = \begin{pmatrix} 1 & 3 & 2 & -4 \\ 0 & 1 & 2 & -5 \\ 2 & 7 & 6 & -3 \\ -3 & -10 & -7 & 2 \end{pmatrix}$

4. Use Cramer's rule to solve the following system:

$$\begin{aligned} x_1 + 3x_2 + x_3 &= 4 \\ -x_1 + 2x_3 &= 2 \\ 3x_1 + x_2 &= 2 \end{aligned}$$

PLEASE TURN OVER

5. Let $u = (1, 0, -1)$, $v = (1, 1, 2)$

   (a) Find the numbers x and y so that $xu + yv = (0, -1, -3)$.

   (b) Show that there exist no numbers a and b so that $au + bv = (1, 1, 3)$.

6. Given the points (0,1), (2,6), (5,31), find parabola $y = ax^2 + bx + c$ passing through them.