MATHEMATICS 221 L05 FALL 2008
MIDTERM EXAMINATION
Friday, October 31, 2008 **Duration: 50 minutes**

I.D.#

I agree that this paper may be placed at the front of the classroom for pick-up.				
Please initial either **YES**		or **NO**		

NO CALCULATORS ALLOWED
ANSWER ALL QUESTIONS
SHOW ALL WORK

LAST NAME_____ **FIRST NAME**_____

[5] **1**. Solve the system:

$$\begin{array}{rcrcrcrcr} x & + & 2y & + & 2z & - & 3u & = & -2 \\ x & + & 2y & + & z & & & = & 0 \end{array}$$

[5] **2**. Let $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$. Express A as a product of elementary matrices.

LAST NAME_____ **FIRST NAME**_____

[10] **3**. Given that $A = \begin{bmatrix} -2 & -1 & -4 \\ 3 & 1 & 6 \\ 2 & 2 & 6 \end{bmatrix}$

(a) Find $adjA$.

(b) Compute $A.djA$.

(c) Find $\det A$.

LAST NAME_____ **FIRST NAME**_____

[5] **4**. Given that A is a 3×3 matrices such that $\det A = -2$. Find $\det(adjA + 4A^{-1})$.

[5] **5**. Consider the system $\begin{array}{rcrcrcr} x & + & y & + & z & = & 1 \\ x & - & y & + & z & = & -1 \\ x & + & 2y & + & 4z & = & 1 \end{array}$. Use Crammer's rule to find the value of y.

LAST NAME_____**FIRST NAME**_____

[5] **6**. A fox hunts in three territories A, B and C. He never hunts in the same territory on two consecutive days. If he hunts in A then he hunts in C the next day. If he hunts in B or C then he is twice likely to hunt in A the next day as in the other territory.
(a) Find the transition matrix P.

(b) If he hunts in A on Monday, what is the probability that he hunts in B the following Thursday?

[5] **7**. Let A denotes a square matrix. Show that the statement: "If $adjA = 0$ then $A = 0$." is FALSE.