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Name: _____

Exam 1

February 13, 2006

Math 210

Lecture 3

Shirin Malekpour

CHECK YOUR TA'S NAME:

JOHN BOWMAN

STEPHEN GRIFFETH

ALI GODJALI

HANJUN KIM

I	20 Points	
II	20 Points	
III	20 Points	
IV	20 Points	
V	20 Points	
Total	100 Points	

WRITE YOUR NAME AND TA'S NAME ON EVERY ANSWER SHEET.
SHOW YOUR REASONING. YOU NEED TO SHOW WORK TO GET FULL CREDIT.

GOOD LUCK!

Name: _____

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 Ali Godjali Hanjun Kim

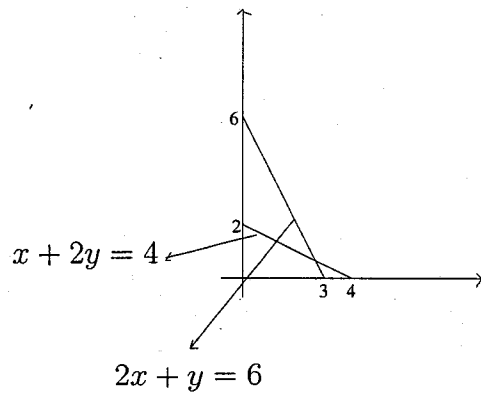
I. (20 points.) Solve the following system:

$$\begin{cases} x_1 - x_2 + x_3 - x_4 = 0 \\ 2x_1 - 2x_2 + x_3 - x_4 = 0 \end{cases}$$

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II. (20 points.) Find the feasible set defined by $2x + y \geq 6$, $x + 2y \geq 4$, $x \geq 0$ and $y \geq 0$. Maximize the objective function $x + y$ on the found feasible set.



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III. (20 points.)

(A) Find the inverse of matrix A, if possible.

$$A = \begin{bmatrix} 4 & 1 \\ 5 & 1 \end{bmatrix}$$

(B) Find a 2×2 matrix B, such that $AB = C$.

$$C = \begin{bmatrix} 1 & 1 \\ -1 & 1 \end{bmatrix}$$

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IV. (20 points.) An economy has 3 goods, electricity, gas and lumber. To produce 1 unit of electricity we need .5 units of electricity and .5 units of lumber. For production of 1 unit of gas, we need .8 units of electricity and .2 units of gas. .1 units of electricity, .4 units of gas and .4 units of lumber are need in production of 1 unit of lumber.

(A) Find the technology matrix for this economy.

(B) Find the external demand which is satisfied by production of 152 units of electricity, 75 units of gas and 130 units of lumber.

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V. (20 points.) A theater has 500 seats, divided into orchestra, main and balcony seating. Orchestra seats sell for \$75, main seats for \$50 and balcony seats for \$35. If all the seats are sold, the gross revenue is \$23,000. If all the main and balcony, but only half the orchestra seats are sold, the gross revenue is \$21,500. How many are there of each kind of seat?