

TEST ONE, MA 114, DR. JING'S SECTION
SEPTEMBER 13, 2005.

Print Your Name:

Signature

1. (20 pts) Solve the following linear system.

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

2. (20 pts) (a) Compute A^{-1} for the matrix (if it exists)

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

3. (20 pts) Find all solution to the following system:

$$\begin{aligned}x + 2y - 2z &= 2 \\2x + 5y - 3z &= 4\end{aligned}$$

4. (20 pts) A company manufactures checker sets and chess sets. Suppose each day the company has available 1,900 boards (for both games) and 80,000 units of wood for making pieces. Each checker set uses 20 units of wood and each chess set uses 80 units of wood. The company makes a profit of \$1 on each checker set and \$1.25 on each chess set. Set up the linear programming problem (i.e. identify the variables, state the function to be optimized and state all constraint inequalities) to for the following question: How many checker sets and how many chess sets should the company make each day in order to maximize its profit? (**Only set up the problem, do not try to solve the problem**)

5. (20 pts) Solve the following linear programming problem: Maximize $P = 10x + y$ subject to

$$\begin{aligned}x + 2y &\leq 12 \\4x + y &\leq 16 \\x \geq 0, y &\geq 0\end{aligned}$$