

Midterm Examination I

CS 525, Semester I, 1999-2000

Monday November 8, 1999

If a problem has no solution or an infinite number of solutions, you must clearly state so and *justify* your claim. Linear dependence relationships should be explicitly stated if they are present.

Each problem can be solved in 3 tableaus or less including the initial tableau.

1. Solve:

$$\begin{aligned}x_1 + 3x_2 - 2x_3 + x_4 &= 1 \\2x_2 + x_4 &= 2 \\3x_1 + 7x_2 - 6x_3 + 2x_4 &= 1\end{aligned}$$

2. Solve:

$$\begin{aligned}\min & \quad x_1 - 2x_2 + 3x_3 \\ \text{subject to} & \quad -x_1 + x_2 - 3x_3 \geq 1 \\ & \quad x_1 + 4x_2 + 4x_3 \leq 3 \\ & \quad 4x_1 + x_2 - 6x_3 \leq 4 \\ & \quad x_1, x_2, x_3 \geq 0\end{aligned}$$