Tutorial 5

1. Consider the LP

$$\begin{array}{lrcrcl} \min & -x_1 & - & 2x_2 & & \\ \text{s.t.} & x_1 & + & x_2 & \geq & 4 \\ & 3x_1 & + & 2x_2 & \leq & 24 \\ & x_1, x_2 \geq 0. & & & & \end{array}$$

   Solve this LP with two phase Simplex method (and compare the solution with that of the big-M method).

2. Use the two phase Simplex method or big-M method to determine whether there is a feasible solution to the following LP (Note: You do **not** need to find an optimal solution).

$$\begin{array}{lrcrcrcl} \min & 3x_1 & - & 2x_2 & & & & \\ s.t. & x_1 & + & 4x_2 & + & 4x_3 & \leq & 2 \\ & & & x_2 & + & x_3 & = & 1 \\ & x_1, x_2, x_3 \geq 0. & & & & & & \end{array}$$

3. Solve the following LP with the two phase Simplex method (and compare the solution with that of the big-M method):

$$\begin{array}{lrcrcrcl} \min & 3x_1 & - & 2x_2 & + & x_3 & & \\ s.t. & -3x_1 & + & 3x_2 & + & 2x_3 & \geq & 10 \\ & 2x_1 & - & 2x_2 & - & x_3 & \geq & 16 \\ & x_1, x_2, x_3 \geq 0. & & & & & & \end{array}$$