

MATH 521 HOMEWORK C
DUE 10/3/16

- (1) Problem 2 from Homework b (the paper problem). Remember, you only need to state the word problem as a linear programming problem, with properly defined variables, an objective function, and appropriate constraints. You do not need to try to solve the LP or place it in tableau form.

- (2) Solve the following LP twice, following different paths, using the simplex method. You should use a calculator/computer to help you do this (borrow a friend's if necessary), but write the intermediate stages of the tableau.

Maximize $z = 30x_1 + 40x_2 + 15x_3$

subject to

$$\begin{cases} 2x_1 + x_2 + 3x_3 & \leq 150 \\ 3x_1 + 2x_2 + x_3 & \leq 100 \\ x_i & \geq 0 \end{cases}$$

- (3) Attempt to solve the following problem by the simplex method. You may possibly encounter a problem, though you also may not. What happens? (Again, use a computer/calculator to help on this)

Maximize: $z = \frac{3}{4}x_1 - 20x_2 + \frac{1}{2}x_3 - 6x_4$

subject to

$$\begin{cases} \frac{1}{4}x_1 - 8x_2 - x_3 + 9x_4 & \leq 0 \\ \frac{1}{2}x_1 - 12x_2 - \frac{1}{2}x_3 + 3x_4 & \leq 0 \\ x_3 & \leq 1 \\ x_i & \geq 0 \end{cases}$$