

§4.2: PREVIEW OF THE SIMPLEX ALGORITHM

1.] Consider the following two variable LP below:

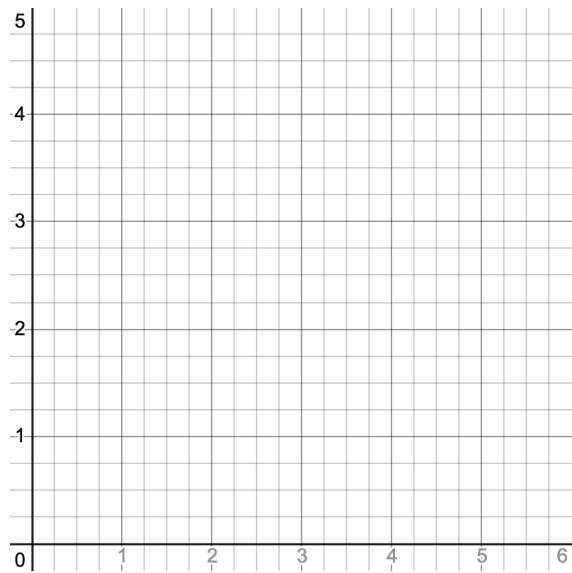
Maximize: $z = 2x_1 + 3x_2$

Subject to: $2x_1 + x_2 \leq 4$

$x_1 + 2x_2 \leq 5$

$x_1, x_2 \geq 0$

Sketch the feasible space on the graph below, labeling the corner points of the feasible space. Convert the LP to standard form and identify all basic solutions with their corresponding objective values by filling out the table below.



Nonbasic Variables	Basic Variables	Basic Solution	Corner Point	Feasible?	Obj Value (z)
x_1, x_2					
x_1, s_1					
x_1, s_2					
x_2, s_1					
x_2, s_2					
s_1, s_2					

2.] Consider the following two variable LP below:

$$\text{Maximize: } z = 2x_1 - 4x_2 + 5x_3 - 6x_4$$

$$\text{Subject to: } x_1 + 4x_2 - 2x_3 + 8x_4 \leq 2$$

$$-x_1 + 2x_2 + 3x_3 + 4x_4 \leq 1$$

$$x_1, x_2, x_3, x_4 \geq 0$$

Convert the LP to standard form and identify all basic solutions with their corresponding objective values by explicitly listing all sets of nonbasic and basic variables and determining the basic solution for each set. For each basic solution, identify the objective function value and whether or not it is feasible. From your listing, determine the optimal solution.