Lab Sheet-1
LPP-Graphical solution and using inbuilt commands in MATLAB

1. For each of the problems mentioned below, do the following

   - Make a MATLAB code that takes C, A and b as input. Assume that the LPPs involve only 2 decision variables (Where at first convert the LPPs in "$max\ C^T x$ subject to $Ax \leq b$" form).

   - Plot a graph containing the constraints using plot commands in MATLAB.

   - In the same graph plot the objective function $Z(x, y) = c$ for at least 3 different constants c.

   - Then compute the extreme points and calculate the value at each extreme point and find the optimal value (Do this step using pen and paper).

   - Verify your solution using the inbuilt command to solve LPPs.

   (a) Maximize $z = 2x_1 + 4x_2$ subject to the constraints:
       $x_1 + 2x_2 \leq 5, x_1 + x_2 \leq 4$ and $x_1, x_2 \geq 0$.

   (b) Maximize $z = 6x_1 + x_2$ subject to the constraints:
       $2x_1 + x_2 \geq 3, x_2 - x_1 \geq 0$ and $x_1, x_2 \geq 0$.

   (c) Maximize $z = x_1 + x_2$ subject to the constraint
       $x_1 + x_2 \leq 1, -3x_1 + x_2 \geq 3, x_1 \geq 0, x_2 \geq 0$.

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