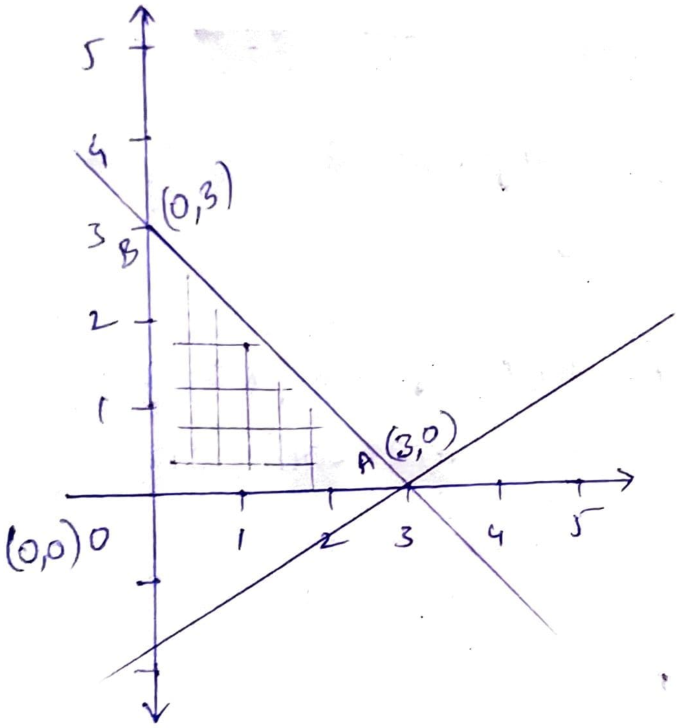
ALM 3 190031187

MP1 Radhakrishna

1a) First, we draw the lines of all the given equations and shade the common region according to the signs.



The feasible region is the intersection of the regions defined by the set of constraints and the co-ordinate axis, the feasible region is represented by O-A-B-O

Finally the objective function is evaluated in each of these points. since B-provides the greatest value to z function and the objective is to maximize, this point is the optimal solution: $z=6$ with $x=0$, $y=3$

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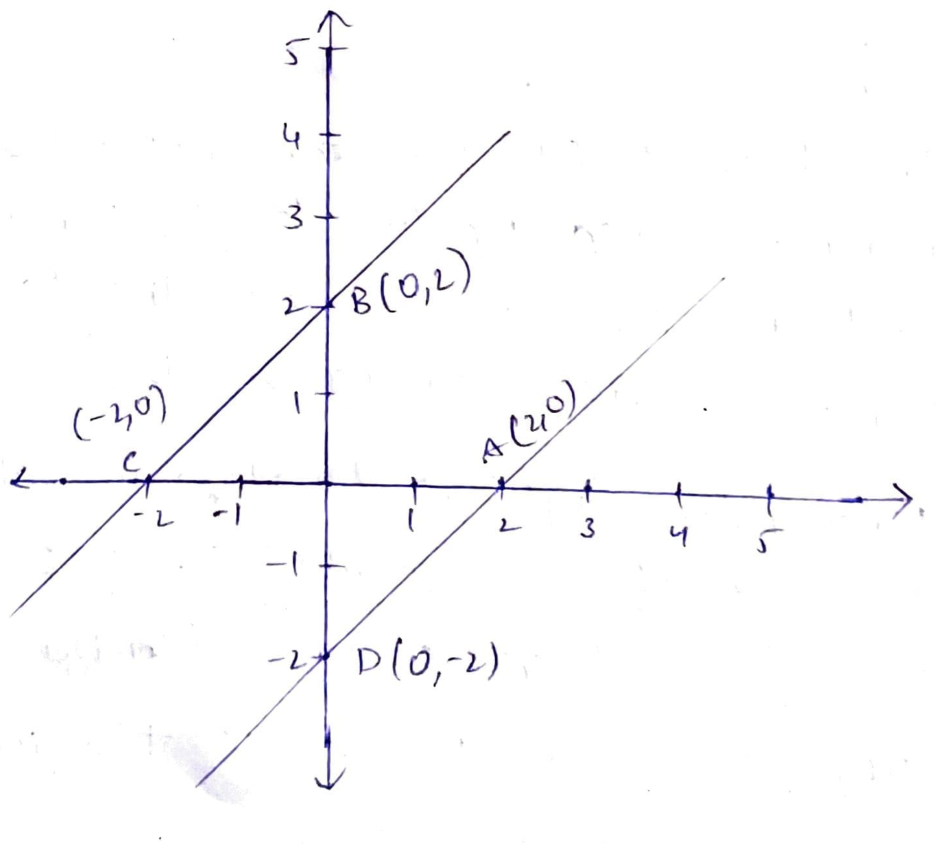
points	coordinates	value
O	(0,0)	0
A	(3,0)	3
B	(0,3)	6

b) Minimize $z = x_1 + x_2$, subject to: $x_1 - x_2 \leq 2$,

$x_1 - x_2 \geq -2$ & $x_1, x_2 \geq 0$

Sol) First we draw the lines of all the given equations and shade the common region according to the signs

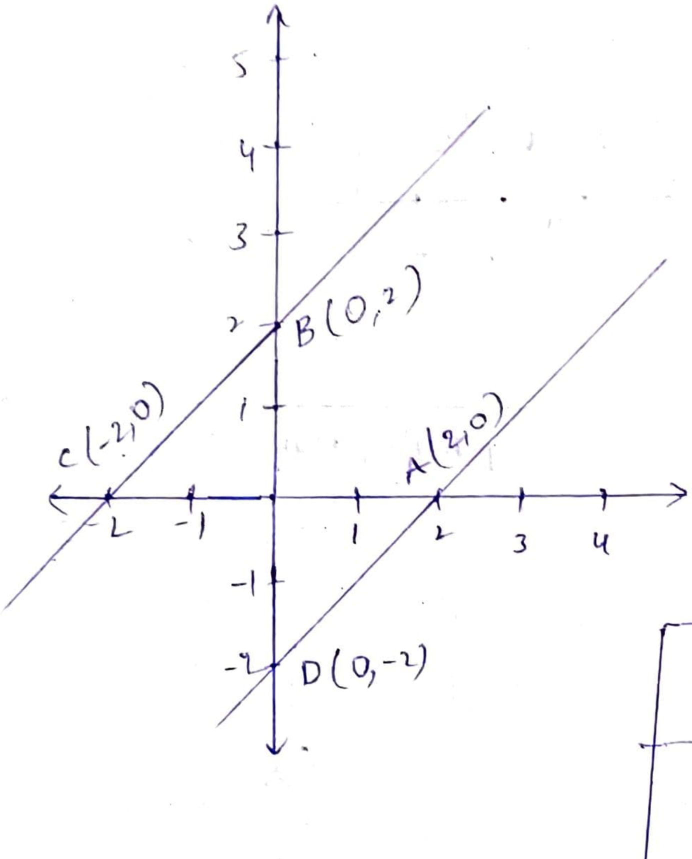


Here we can say that more than one solution exists, so, there is no optimal solution

c) Maximize $z = x_1 + x_2$, subject to: $x_1 - x_2 \leq 2$

$x_1 - x_2 \geq -2$, $x_1, x_2 \geq 0$

Sol) First draw the lines of all the given eqns and shade the common region according to the signs.



points	coordinates	Value (z)
O	(0,0)	0
A	(2,0)	2
B	(0,2)	2
C	(-2,0)	-2
D	(0,-2)	-2

So, there is no optimal solution

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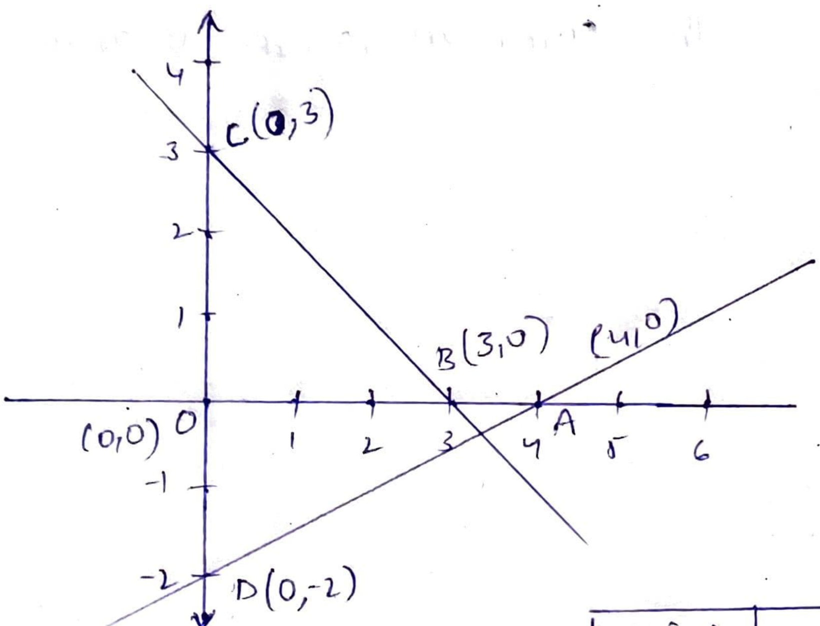
d) Maximize $z_1 = 3x_1 + 4x_2$, subject to:

$x_1 - 2x_2 \geq 4$, $x_1 + x_2 \leq 3$ $x_1, x_2 \geq 0$

sol) First draw the lines of with the given equations and shade the common region according to the signs



points	coordinates	value
O	(0,0)	0
A	(4,0)	12
B	(3,0)	9
C	(0,3)	12
D	(0,-2)	-8