

Concepts to be studied from the lectures only!

→ We must solve some questions for our practice.

Procedure is to use the given constraints and values, to create a primal problem of linear Programming and then use that primal problem for getting various eqⁿ and constraints. Based on that we draft the graphical sol.

→ The corner points from the graph are taken, and value is checked on those points, to find the best value.

Ques. Example Problem 2

A company makes chairs and tables. A chair takes 1 hour to assemble and 2 hours to finish. A table takes 2 hours to assemble and 1 hour to finish. The company has a total of 100 assembly hours and 110 finishing hours available per week. If the profit is \$20 per chair and \$30 per table, how many of each should the company produce to maximize profit?

⇒ $x \rightarrow$ chairs

⇒ $y \rightarrow$ tables

for assembling part →

We have 100 hrs for assembly.

1 hr for a chair. ⇒ $x + 2y \leq 100$ — (1)
2 hrs for a table.

for finishing part →

We have 110 hrs for assembly.

2 hrs for finishing a chair

1 hr for finishing a table.

⇒ $2x + y \leq 110$. — (2)

Nullity constraint →

⇒ $x \geq 0$

and ⇒ $y \geq 0$

Nullity constraint →

$$\Rightarrow x \geq 0 \quad \textcircled{3}$$

$$\text{and } \Rightarrow y \geq 0 \quad \textcircled{4}$$

for profit condition

$$\Rightarrow 20x + 30y \quad \left. \vphantom{\Rightarrow} \right\} \text{The optimization function.}$$

Aim: Maximize $20x + 30y$

$$x + 2y \leq 100$$

$$x \geq 0$$

$$2x + y \leq 110$$

$$y \geq 0$$

→ Feasible solution is always "CONVEX".

