



Republic of the Philippines
City of Olongapo

GORDON COLLEGE

Olongapo City Sports Complex, East Tapinac, Olongapo City
Tel. No. (047) 224-2089 loc. 314



LECTURE

(Production problem) Winkler Furniture manufactures two different types of china cabinets: a French Provincial model and a Danish Modern model. Each cabinet produced must go through three departments: carpentry, painting, and finishing. The table on this page contains all relevant information concerning production times per cabinet produced and production capacities for each operation per day, along with net revenue per unit produced. The firm has a contract with an Indiana distributor to produce a minimum of 300 of each cabinet per week (or 60 cabinets per day). Owner Bob Winkler would like to determine a product mix to maximize his daily revenue.

- (a) Formulate as an LP problem.
- (b) Solve using an LP software program or spreadsheet.

a. Formulate as an LP Problem

Decision Variables:

- x1: Number of French Provincial cabinets produced daily
- x2: Number of Danish Modern cabinets produced daily

Objective Function (Maximize):

- Total Daily Revenue = $100x_1 + 80x_2$ (assuming net revenue of \$100 per French Provincial and \$80 per Danish Modern)

Constraints:

1. Carpentry Shop Capacity:



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- $\text{Carpentry time per French Provincial (C1)} * x1 + \text{Carpentry time per Danish Modern (C2)} * x2 \leq \text{Daily Carpentry Capacity (Ca)}$

2. Painting Shop Capacity:

- $\text{Painting time per French Provincial (P1)} * x1 + \text{Painting time per Danish Modern (P2)} * x2 \leq \text{Daily Painting Capacity (Pp)}$

3. Finishing Shop Capacity:

- $\text{Finishing time per French Provincial (F1)} * x1 + \text{Finishing time per Danish Modern (F2)} * x2 \leq \text{Daily Finishing Capacity (Ff)}$

4. Non-negativity:

- $x1 \geq 0$ (cannot produce negative cabinets)
- $x2 \geq 0$ (cannot produce negative cabinets)

b. Solve using an LP Software program or spreadsheet

Linear Programming Results					
Wrinkler Furniture Solution					
	French	Danish		RHS	Dual
Maximize	100	80			
Carpentry	2	1	\leq	40	35
Painting	1	2	\leq	30	0
Finishing	1	1.5	\leq	25	30
Solution	17.5	5		2150	