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Q1.

x_1	x_2
x3 labor	x1 labor
$8 profit	$5 profit
Type 1	Type 2

Production Quota → 450 x_2

$x_1 \leq 100$, $x_2 \leq 300$

Market Limits

↓

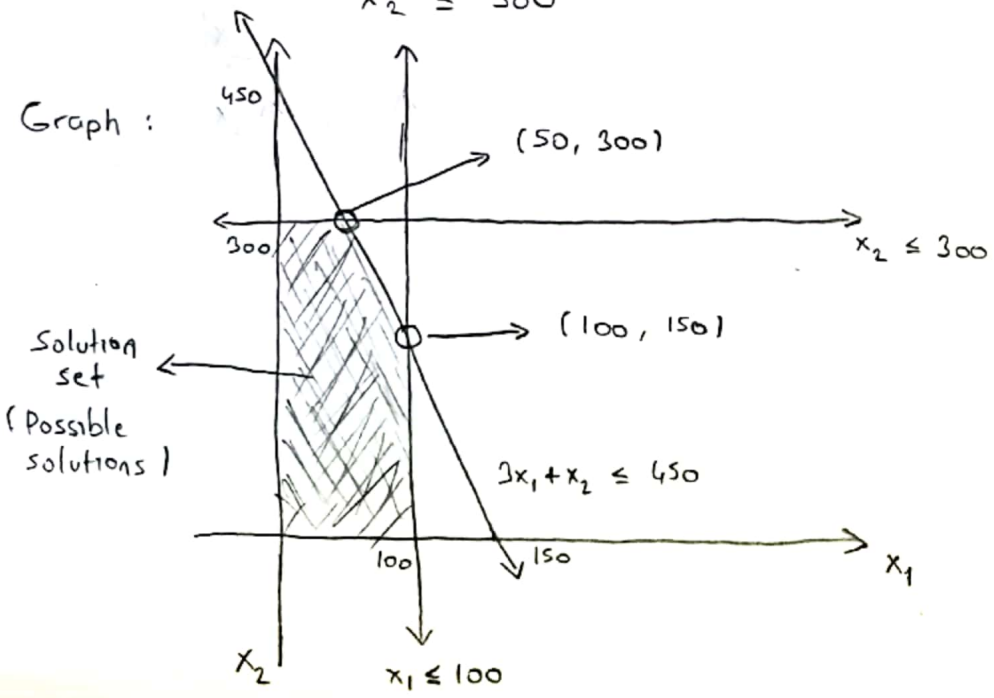
Maximize Profit : $8x_1 + 5x_2$

Constraints : $3x_1 + x_2 \leq 450$ } Production Quota

$x_1 \leq 100$ } Market Limits

$x_2 \leq 300$

Graph :



I am only checking these two vertices to ensure that we use the whole production quota since we want to maximize the profit

Let's check vertices :

$8.50 + 5.300 = 1900$

P (50, 300) ↑

$8.100 + 5.150 = 1550$

P (100, 150) ↑

Then optimum solution would be :

50 Type 1 , 300 Type 2