Berkay Ağar 26.04.2023

I am aware that any forms of cheating in this exam will result in a zero grade and a disciplinary investigation. I accept all rules and regulations regarding online exams. I give permission for the processing of my personal data as stated in the clarification text provided on the faculty of engineering.

Wild West produces two types of cowboy hats. A type 1 hat requires three times much labor time as a type 2. If all available labor time is dedicated to type 2 alone the company can produce 450 type 2 hats a day. The market limits for two types are 100 and 300 hats per day for type 1 and type 2 respectively. The profit is $8 per type 1 hat and $5 per type 2 hat determine the number of hat maximize profit

i. Build a mathematical model
ii. Solve problem graphically

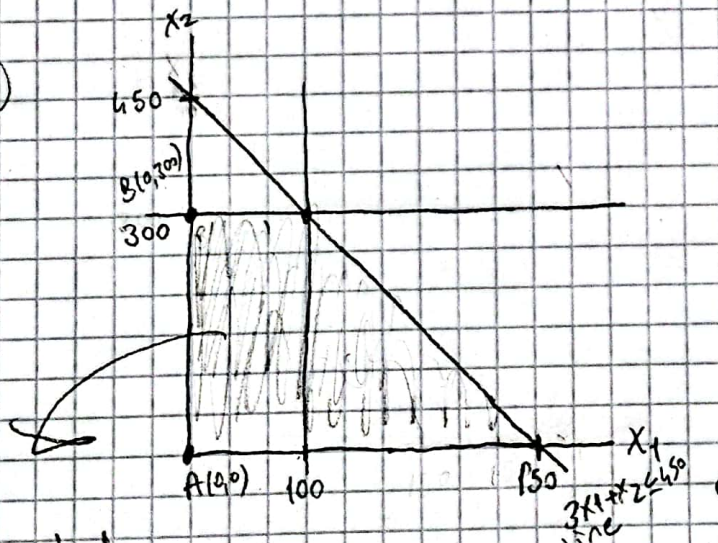
(i)

X_1 = amount of 1 type hat
X_2 = amount of 2 type hat

$\max Z = 5X_1 + 8X_2$

$3X_1 + X_2 \leq 450 \rightarrow X_2 = 450 \quad X_1 = 150$
$X_1 \leq 100 \rightarrow 100$
$X_2 \leq 300 \rightarrow 300$
Also $X_1 \geq 0, X_2 \geq 0$

(ii)



And points are;
(0,300)
(0,0)
(150,0)
(100,300) optimal point

Bounded feasible region

$5 \cdot 100 + 8 \cdot 300 = 2900$