BERKEM ARAS 150119069 IE1035 Quiz-1

I am aware that any form of cheating in this exam will result in a zero grade and a disciplinary investigation. I accept all the rules and regulations regarding online exam. I give permission for the processing of my data as stated in the Clarification Text provided on the Faculty of Engineering website.

Berkem ARAS
150119069

Question] Wild west produces two types of cowboy hats. A type 1 hat requires three times as much labor time as a type 2. If the all available labor time is dedicated to type 2 alone, the company can produce a total of 450 type 2 hats a day. The market limits for the 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 hats of each type that would maximize profit.

i. Build the mathematical model of the problem.

ii. Solve the problem graphically.

Solution]

Type 1 → x number of hats

Type 2 → y number of hats.

function

$\max z = 8x + 5y$

$3x + y \leq 450$

$x \leq 100$

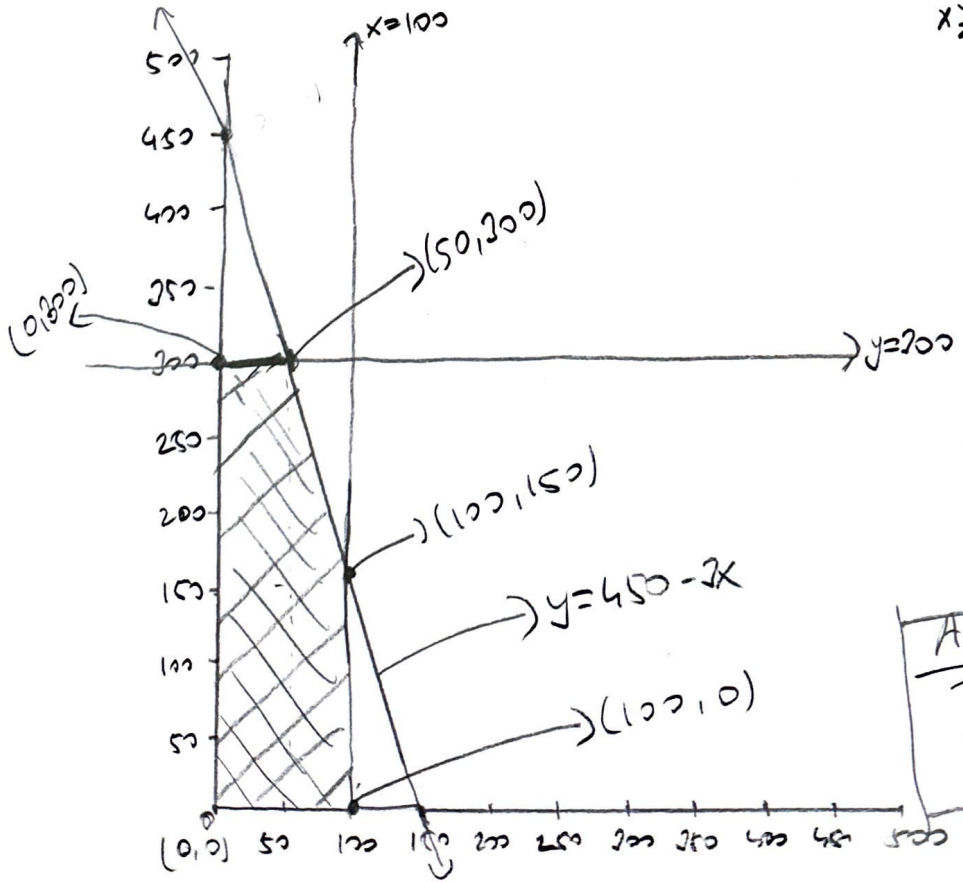
$y \leq 300$

$x \geq 0 \quad y \geq 0$

$\Rightarrow y = 450 - 3x$

$x = 100$

$y = 300$



Coordinates	(8x+5y) profit
(0,0)	0
(100,0)	800
(100,150)	1550
(50,300)	1900 → max
(0,300)	1500

Answer

Type 1 ⇒ 50

Type 2 ⇒ 300