

Name - Surname: Enes Yusa Dülger

Student ID: 150119010

Department: CSE

"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 website."

1. 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 two types are 100 and 300 hats per day for type 1 and type 2, respectively. The profit is \$8 per Type 1 and \$5 for Type 2 hat. Determine the number of hats of each type that would maximize profit.

- Build the mathematical model of the problem
- Solve the problem graphically.

i. Type 1 \rightarrow x number of hats
Type 2 \rightarrow y number of hats

type 1 \Rightarrow 3 a hours

type 2 \Rightarrow a hours

max available = 450 a hours

$$3x + y = 450 \quad \&$$

Objective function

$$\max z = 8x + 5y$$

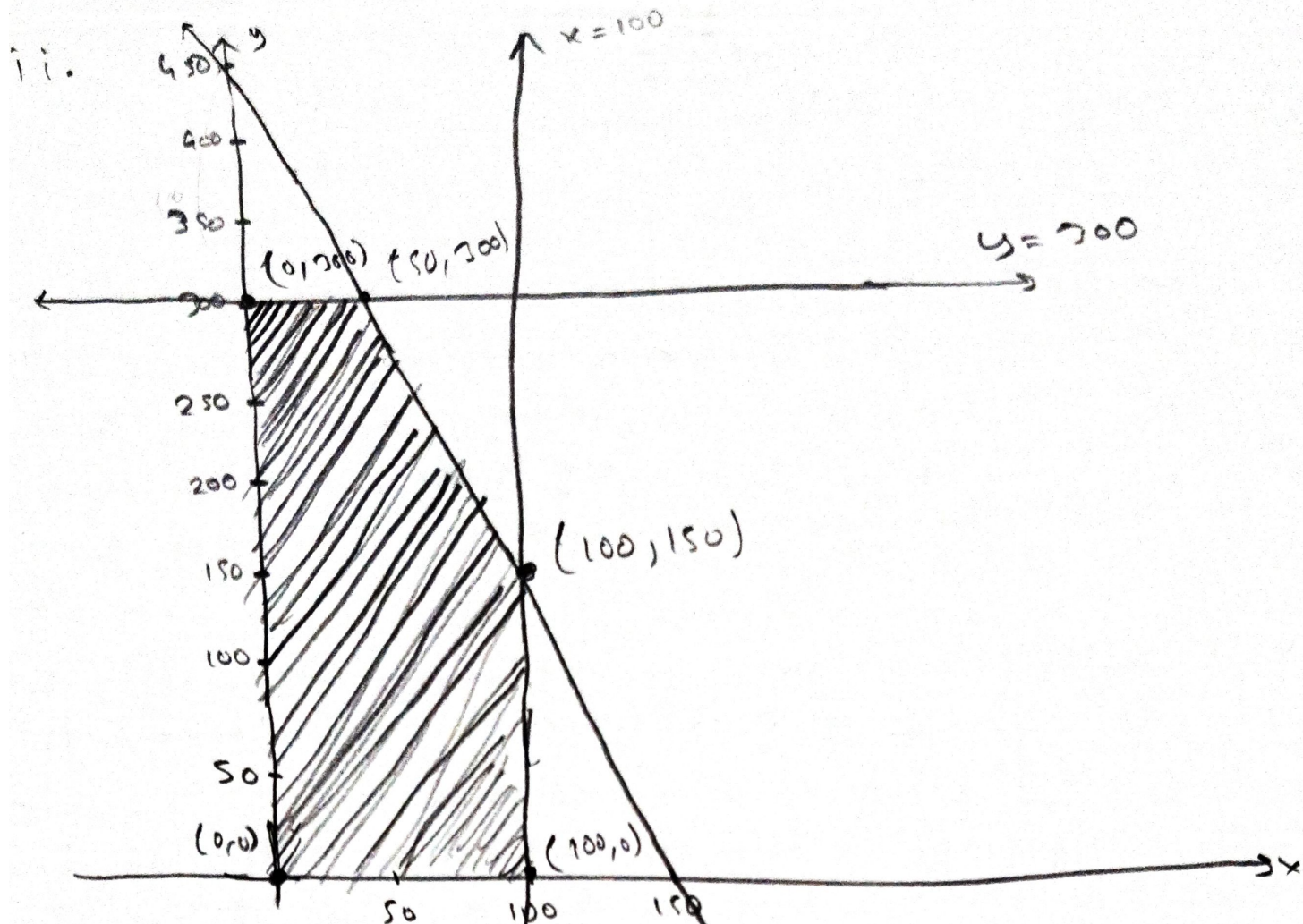
constraints

$$3x + y \leq 450$$

$$x \leq 100$$

$$y \leq 300$$

$$x \geq 0, y \geq 0$$



coordinates	$z = 8x + 5y$
$(0,0)$	0
$(100,0)$	800
$(0,300)$	1500
$(100,150)$	1550
$(50,300)$	1900

max

$3x + y = 450$

The maximize profit, produce
 type 1 $\rightarrow 50$
 type 2 $\rightarrow 300$