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IE 3035 Quiz 1

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- 1) Wild west produces two types of cowboy hats. A type 1 hat requires 3 times as much labor time as type 2. If the all available labor time is dedicated to type 2, the company can produce a total of 450 type 2 hats today. The market limits for two types 100 and 300 the profit is \$8 per type 1 \$5 per type 2. Determine the number of hats of each type that will max. profit.
- i. Build math. model of the problem
 - ii. Solve graphically.

i. answer)

of type 1 = x_1

of type 2 = x_2

$$8x_1 + 5x_2 = \text{profit (to maximize)}$$

$$3x_1 + x_2 \leq 450$$

$$x_1 \leq 100$$

$$x_2 \leq 300$$

$$x_1, x_2 \geq 0$$

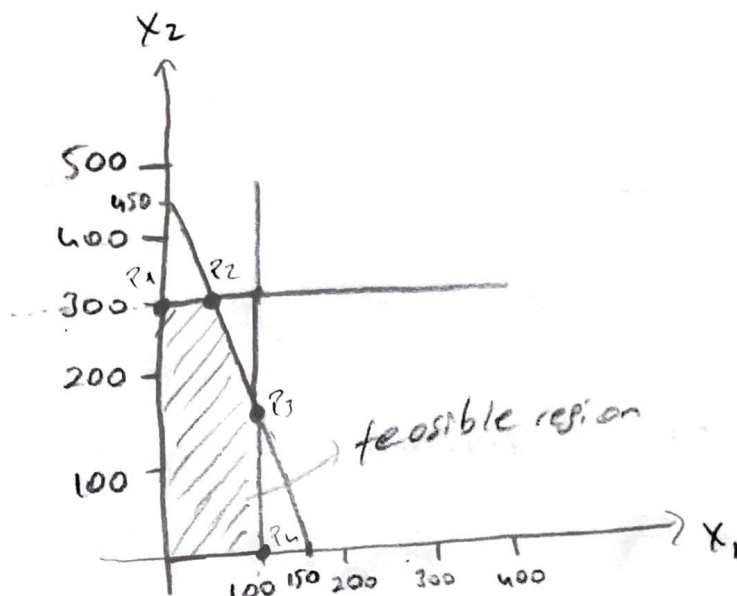
(i. answer)

$$x_1 \leq 100$$

$$x_2 \leq 300$$

$$3x_1 + x_2 \leq 450$$

$$x_1, x_2 \geq 0$$



$$P_1: 8(0) + 5(300) = 1500\$$$

$$P_2: 8(50) + 5(300) = 1900\$ \rightarrow \text{profit maximized.}$$

$$P_3: 8(100) + 5(150) = 1550\$$$

$$P_4: 8(100) + 5(0) = 800\$$$

$$\# \text{ of type 1} = 50$$

$$\# \text{ of type 2} = 300 > 8(50) + 5(300) = 1900\$$$