

Egri EREN

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Q.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 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.

Objective:

Maximize the profit

$$8 \cdot x_1 + 5 \cdot x_2 = P$$

Labor times

$$(3 \cdot x_1 + x_2) \leq 450$$

Constraints:

$$x_1 \leq 100$$

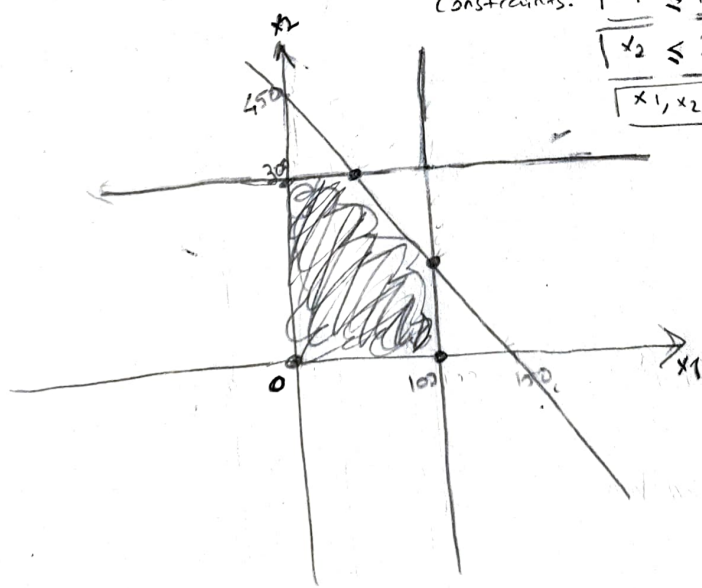
$$x_2 \leq 300$$

$$x_1, x_2 \geq 0$$

$$3x_1 + x_2 = 450$$

$$x_1 = 0 \quad x_2 = 450$$

$$x_2 = 0 \quad x_1 = 150$$



CORNERS	PROFIT
0, 0	→ 0
100, 0	→ 800
0, 300	→ 1500
100, 150	→ 1550
50, 300	→ 1900

$x_1 = 50$ / $x_2 = 300$
Type 1 Type 2