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QUIZ 1

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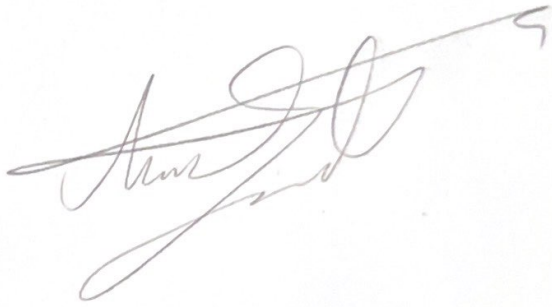

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1. Wild West produces two types of cowboy hats. A type 1 hat requires three times as much labor time as type 2. If the all available labor time is dedicated to Type 2 alone, the company can produce a total of 450 Type 2 hats a day. The market limits 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

$Z = 8x_1 + 5x_2$

x_1: Total number of hats produced in Type 1

x_2: Total number of hats produced in Type 2

800 + 1500

a: $x_1 \leq 100$ (market limit for Type 1 hat)

b: $x_2 \leq 300$ (market limit for Type 2 hat)

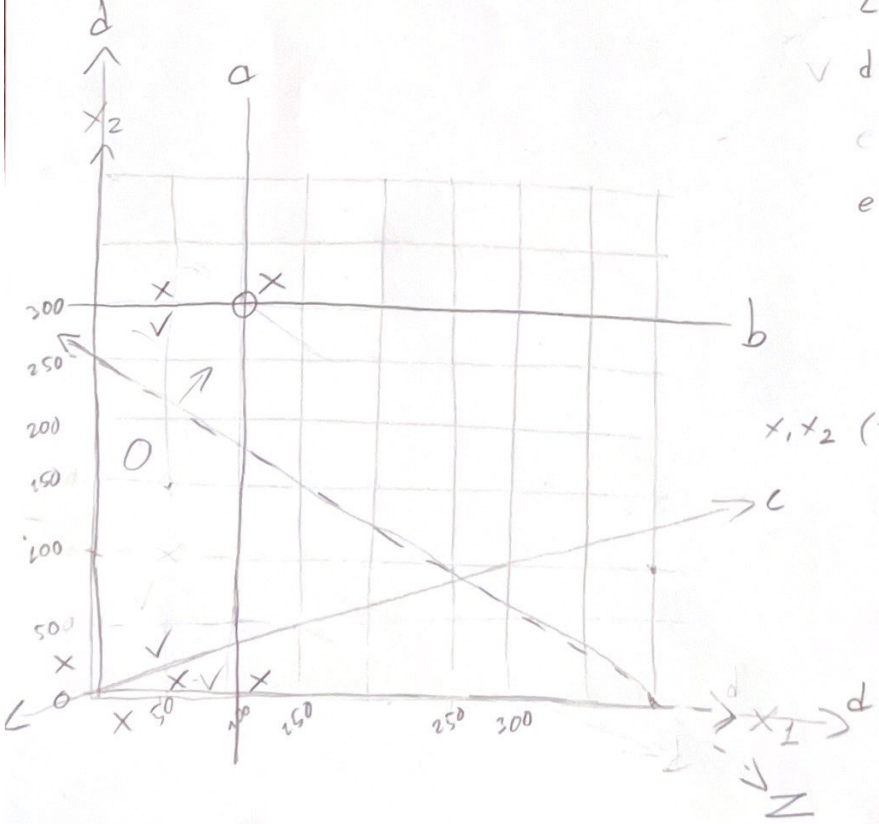
c: $x_1 \geq 3x_2$ (time ratio for Type 1 & 2)

d: $x_1, x_2 \geq 0$

$x_1, x_2 \in N$ (integer constraint)

e: $x_2 \leq 400$ (factory limit for Type 2)

$x_1 - 3x_2 \geq 0$



x_1, x_2 (100, 300)