

A furniture manufacturer makes two types of furniture: chairs and sofas. Their production involves three stages: carpentry, finishing and upholstery. Each chair requires six hours of carpentry, one hour of finishing, and two hours of upholstery. Each sofa requires three hours of carpentry, one hour of finishing, and six hours of upholstery. At the moment the factory has ninety-six surplus labour-hours in carpentry, eighteen in finishing, and seventy two in upholstery. The profit per chair is eighty dollars, and the profit per sofa is seventy dollars. How many chairs and sofas should be produced each day to maximize the profit?

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Maximize profit = $80C + 70S$

subject to:

→ Carpentry

$6C + 3S \leq 96$

Finishing

$C + S \leq 18$

→ Upholstery

$2C + 6S \leq 72$

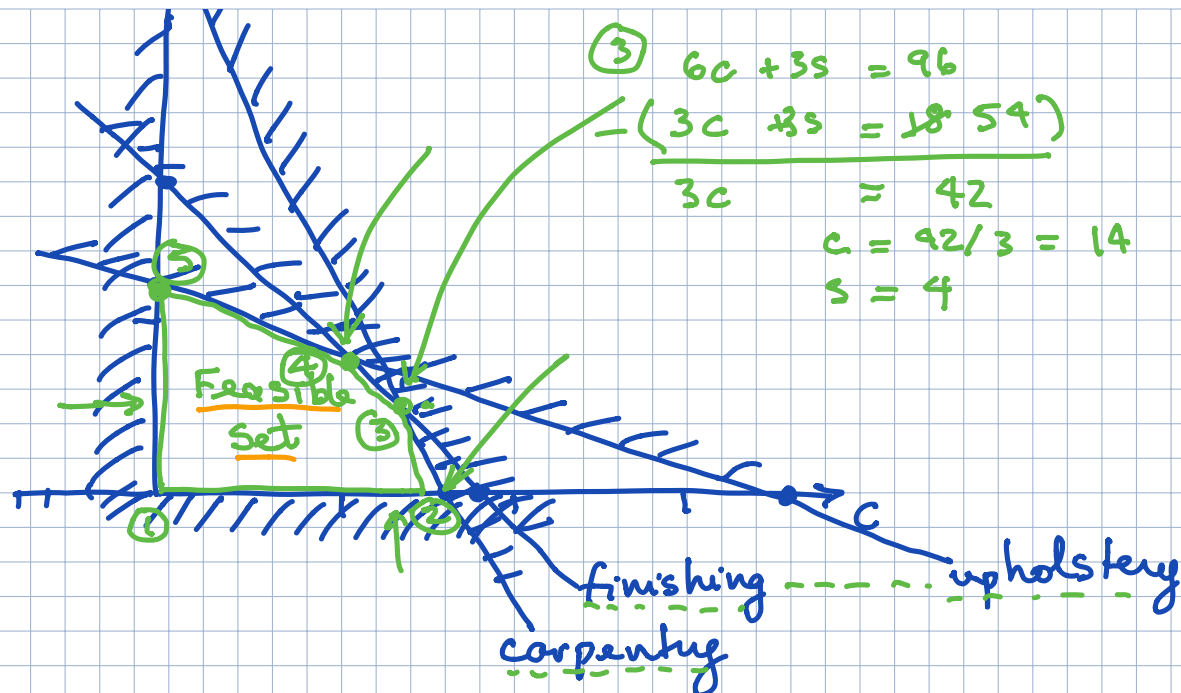
C	S
16	0
0	32
18	0
0	18
36	0
0	12

Intercepts:



Formal Constraints:

$C \geq 0 \quad S \geq 0$



	C	S	profit = $80C + 70S$	④ $C + S = 18$
• ①	0	0	0	
• ②	16	0	$80(16) + 0 = 1280$	$2C + 6S = 72$
• ③	<u>14</u>	<u>4</u>	$80(14) + 70(4) = 1400$ *	$-(2C + 2S = 36)$
• ④	9	9	$80(9) + 70(9) = 1350$	$4S = 36$ $S = 9$
• ⑤	0	12	$0 + 70(12) = 840$	$C = 9$

14 chairs and 4 sofas should be produced daily for a maximum profit of \$1,400.