◇ Changes in objective function

↳ used to determine optimal number of units when possibility of buying from another producer exists.

○ Example 1

↳ Demand:
- * A : 200 units
- * B : 150 units

↳ Outside contribution:
- * A : R1,50
- * B : R1,00

↳ Constraints unchanged

1. $6A + 12B \leq 1200$
2. $10A + 6B \leq 1200$
3. $3B \leq 270$

↳ How much of A and B needs to be produced and how much of A and B need to be bought, such that profit is maximised?

□ Calculate differential contribution

	A	B
Current contr.	R2,00	R2,50
Outside contr.	R1,50	R1,00
Differential contr.	R0,50	R1,50

↳ interpret: * net profit that producing them yields

↳ Aim: optimise contribution in terms of units produced

∴ need to change objective function:

$$P = 0{,}5A + 1{,}5B$$

↳ $B = -\frac{1}{3}A + \frac{2}{3}P$

↳ Let $\frac{2}{3}P = 100 \Rightarrow P = 150$

$$B = -\frac{1}{3}A + 100$$

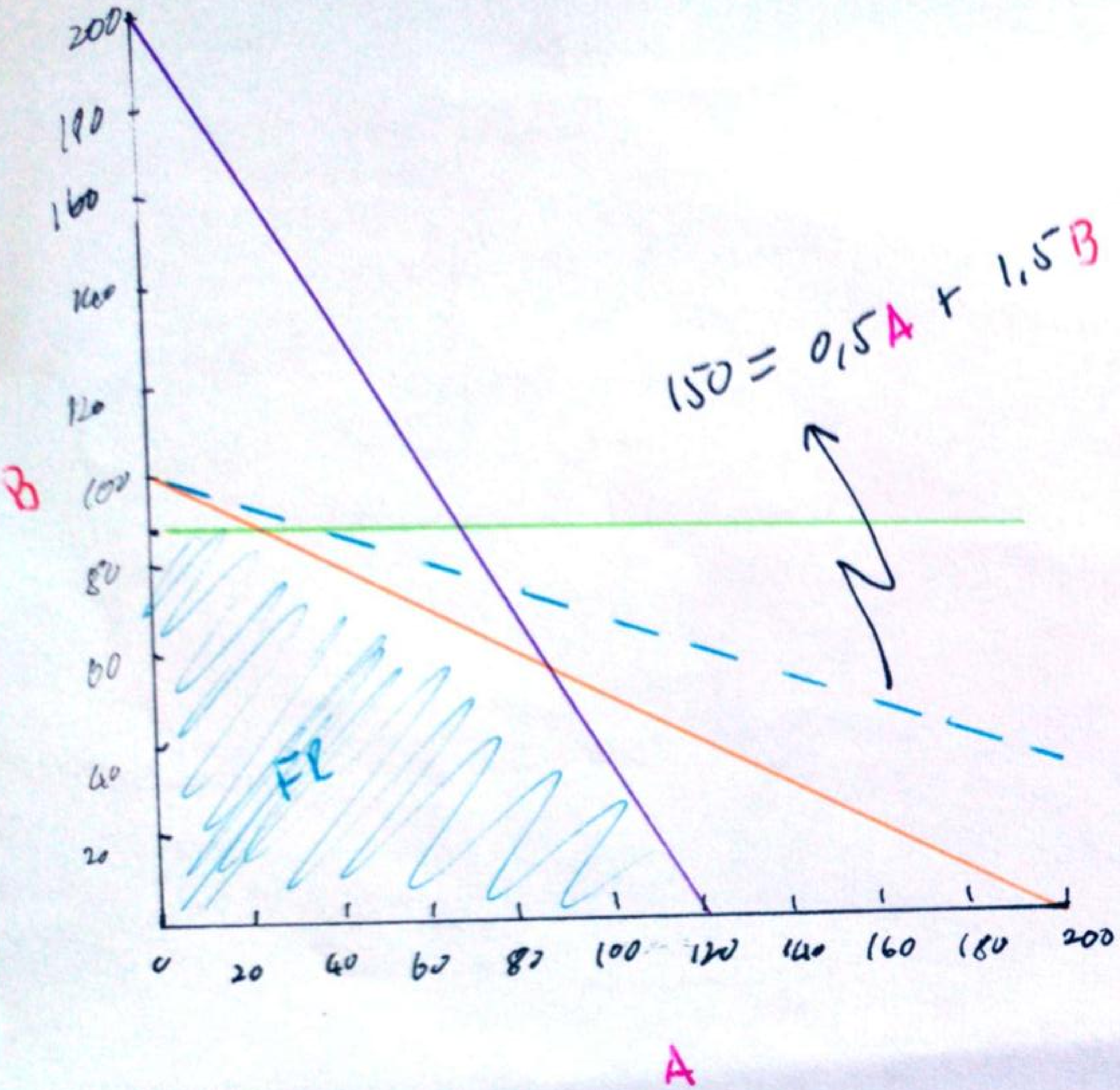
<u>or</u>

$$150 = 0{,}5A + 1{,}5B$$

↳ intercepts

- A @ 300
- B @ 100

IRCL5



↳ where

(1) $6A + 12B = 1200$

and (3) $3B = 270$

⇒ Optimal mix :

$B = 90$

$A = 20$

Total contribution table

Product	Internal Production	Profit	Total
A	20	2	40
B	90	2,5	225
	External purchase		
A	180	1,5	270
B	60	1	60
			595

Exercise

↳ Determine profit if still producing 85 of A and 57 of B

↳ purchase remaining demand