1

Defina: $\forall X \in \{A,B,C,D\}$, X é a quantidade de líquido X vendido sem transformação; E_X, F_X, G_X, P_X são as quantidades vendidas através de cada um destes; isto é, por exemplo: G_C é a quantidade de litros de C usados para formar G e vendidos.

Temos:

- $A + E_A + F_A + G_A + P_A \leq 8000$
- $B + E_B + F_B + G_B + P_B \leq 4250$
- $C + E_C + F_C + G_C + P_C \leq 16000$
- $D + E_D + F_D + G_D + P_D \leq 2000$
- $E_A = 0.3 \overbrace{(E_A + E_B + E_C + E_D)}^{E}$, $F_B \geq 0.1E$, $E_C = 0.4E$, $F_D \leq 0.05E$
- $F_A \geq 0.25F$, $F_B \leq 0.2F$, $F_C = 0.2F$, $F_D \geq 0.1F$
- $G_A \geq 0.2G$, $G_B \geq 0.15G$, $G_C = 0.4G$, $G_D \leq 0.2G$
- $E \geq 400$, $F \geq 800$, $G \geq 200$
- Temos

	A	B	C	D
P	$\frac{0.7}{3}$	$\geq \frac{0.4}{3}$	0.4	≤ 0.15

$\Rightarrow P_A = \frac{0.7}{3}P$, $P_B \geq \frac{0.4}{3}P$, $P_C = 0.4P$, $P_D \leq 0.15P$

- Queremos $\max 6(A+B+C+D) + 11E + 15F + 14G + 22P - 5.5(A + 2Y_A) - \ldots$

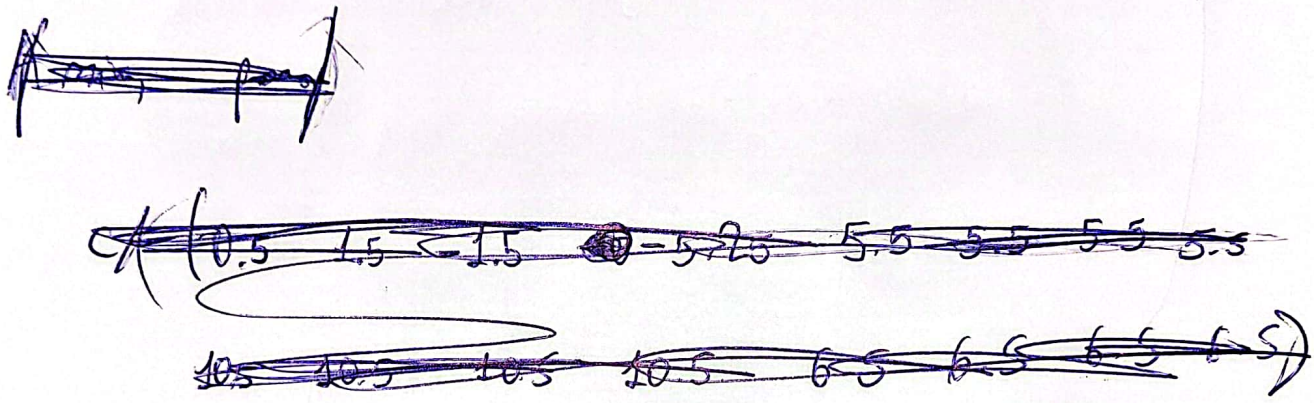
0 lucro: $6A+6B+6C+6D+11E_A+11E_B+11E_C+11E_D$

$+15F_A+15F_B+15F_C+15F_D+14G_A+14G_B+14G_C+11G_D+22P_A+22P_B+$

$+22P_C+22P_D-5.5A-5.5E_A-5.5F_A-5.5G_A-5.5P_A-$

$-4.5B-4.5E_B-4.5F_B-4.5G_B-4.5P_B-7.5C-7.5E_C-7.5F_C-$

$-7.5G_C-7.5P_C-11.25D-11.25E_D-11.25F_D-11.25G_D-11.25P_D$



Para

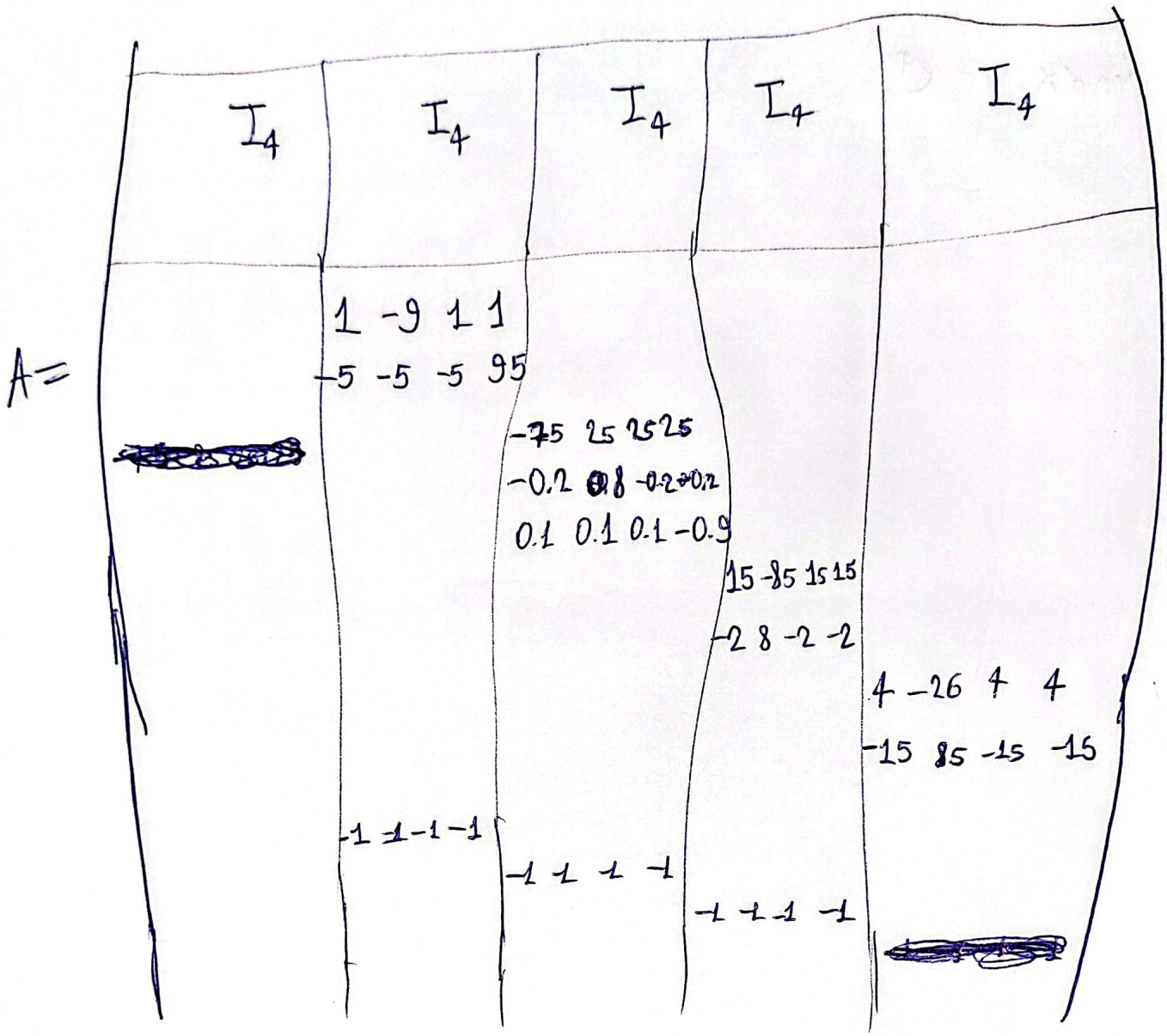
$C=(0.5 \quad 1.5 \quad -1.5 \quad -5.25 \quad 5.5 \quad 6.5 \quad 3.5 \quad -0.25$

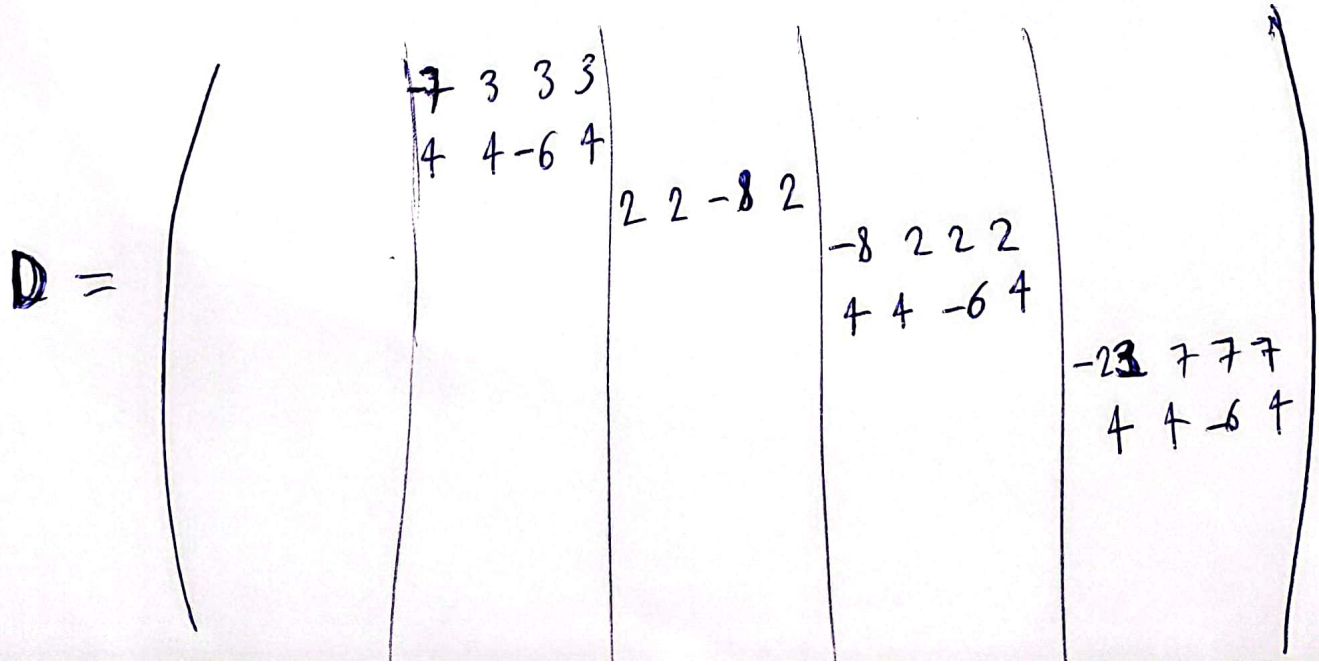
$9.5 \quad 10.5 \quad 7.5 \quad 3.75 \quad 8.5 \quad 9.5 \quad 6.5 \quad 2.75$

$16.5 \quad 17.5 \quad 14.5 \quad 10.75)^T$

$X=(A\ B\ C\ D\ E_A\ E_B\ E_C\ E_D\ F_A\ F_B\ F_C\ F_D$

$G_A\ G_B\ G_C\ G_D\ P_A\ P_B\ P_C\ P_D)^T$


A=
I_4
I_4
I_4
I_4
I_4
1 -9 1 1
-5 -5 -5 95
-75 25 25 25
-0.2 0.8 -0.2 -0.2
0.1 0.1 0.1 -0.9
15 -85 15 15
-2 8 -2 -2
4 -26 4 4
-15 85 -15 -15
-1 1 -1 -1
-1 1 1 -1
-1 1 -1 -1


D =
-7 3 3 3
4 4 -6 4
2 2 -8 2
-8 2 2 2
4 4 -6 4
-23 7 7 7
4 4 -6 4

$$a = (8000 \quad 4250 \quad 16000 \quad 2000 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -400 \quad -800 \quad -200)^T$$

$$d = 0_{7\times 1)}$$

Novo PPL é:

$$\max. \quad c^T x$$

$$\text{s.t.} \quad Ax \leq a$$
$$Dx = 0$$
$$x \geq 0$$

Para a forma padrão:

$$\max. \quad c^T x$$

$$\text{s.t.} \quad \begin{pmatrix} A \\ D \\ -D \end{pmatrix} x \leq \begin{pmatrix} a \\ 0 \\ 0 \end{pmatrix}.$$

$$x \geq 0$$