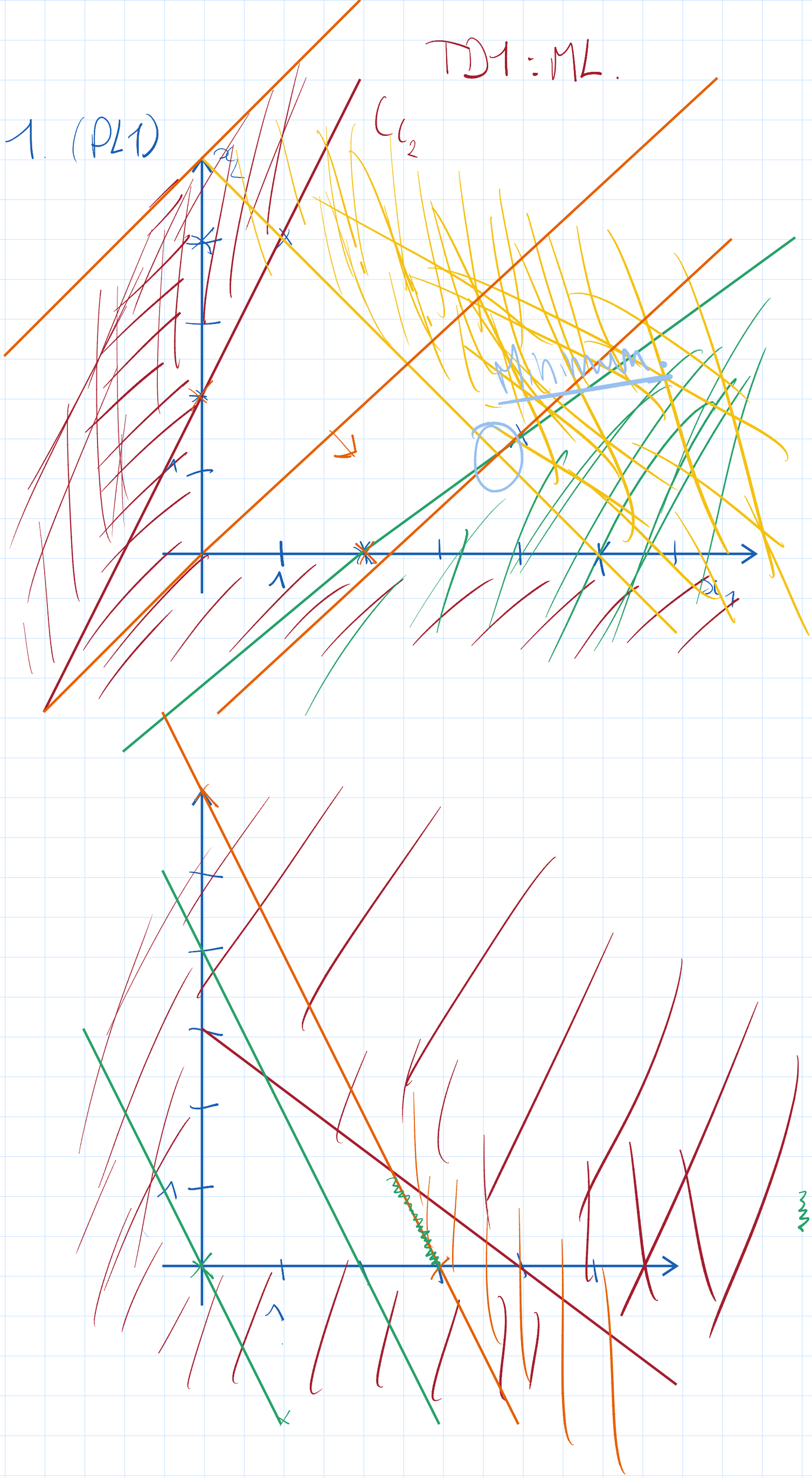
TD1 : ML.

1. (PL1)



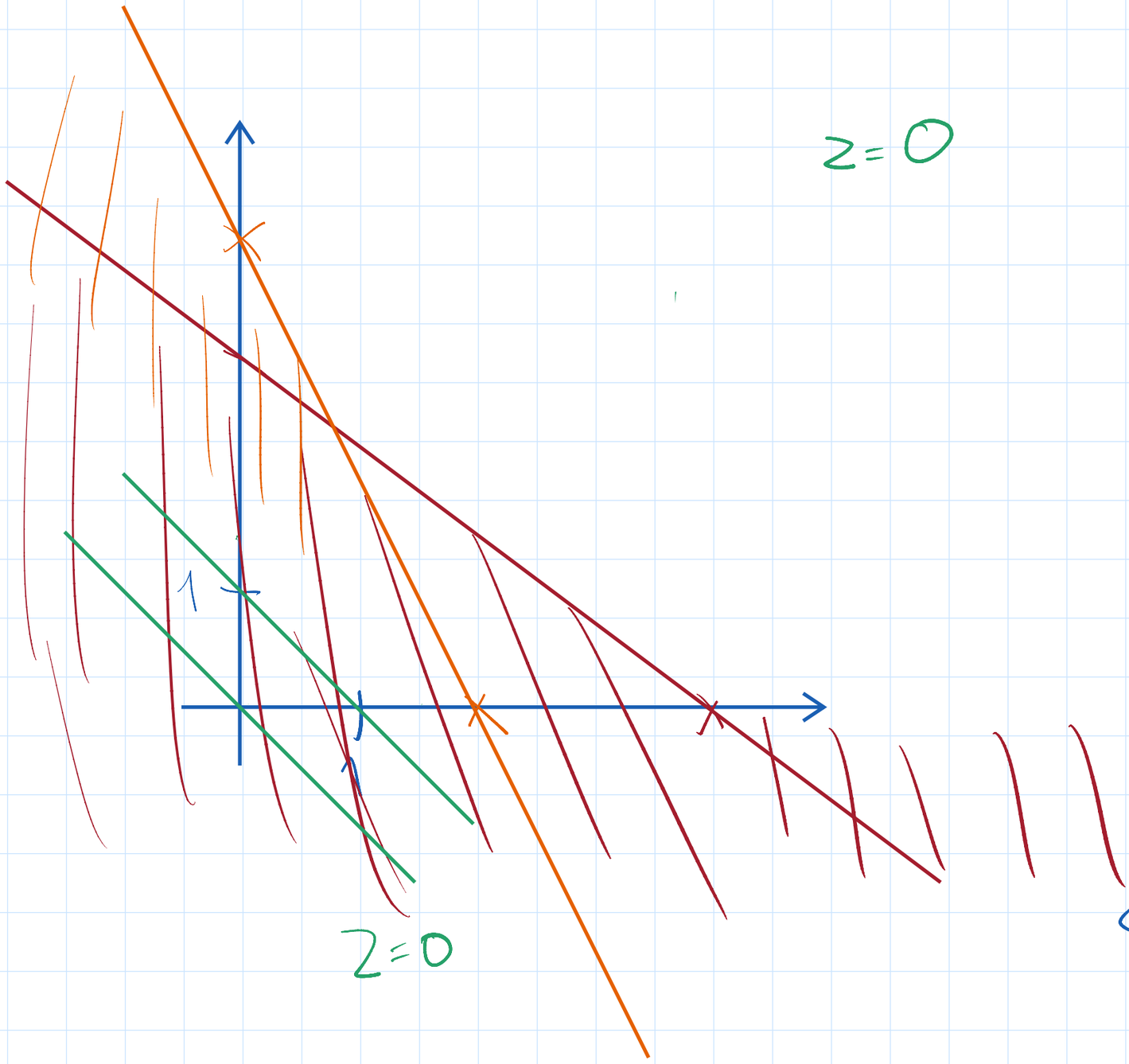
$$\begin{cases} x_2 - x_1 = z[min] & l_1 \\ -2x_1 + x_2 \leq 2 & l_2 \\ x_1 - 2x_2 \leq 2 & l_3 \\ x_1 + x_2 \leq 5 & l_4 \\ x_1, x_2 \geq 0 \end{cases}$$

$x_2 - x_1 = 2$

$x_2 - x_1 = 3$

$$\begin{cases} -2x_1 - x_2 = z[min] \\ 3x_1 + 4x_2 \leq 12 \\ -2x_1 - x_2 \geq -6 \\ x_1, x_2 \geq 0. \end{cases}$$

$\rightsquigarrow z[min]$



$z = 0$

$-x_1 - x_2 = -2$

$$\begin{cases} 3x_1 + 4x_2 = 12 \\ 2x_1 + x_2 = 4 \end{cases}$$

$$\Leftrightarrow \begin{cases} 3x_1 + 4x_2 = 12 \\ x_2 = 4 - 2x_1 \end{cases}$$

$$\Leftrightarrow \begin{cases} 3x_1 + 4(4 - 2x_1) = 12 \\ x_2 = 4 - 2x_1 \end{cases}$$

$$\Leftrightarrow \begin{cases} -5x_1 = -4 \Rightarrow x_1 = \frac{4}{5} \\ x_2 = 4 - \frac{8}{5} \end{cases}$$

$\Rightarrow x_2 = \frac{12}{5}$.

Exo 2 :

x_1 ↑ x_2 ↑

variables : nb_pubs_télé, nb_pubs_magazine

$x_1 \geq 10$

$200000 x_1 + 100000 x_2 \leq 1\,000\,000$

$1800000 x_1 + 1000000 x_2 = z$ [max]