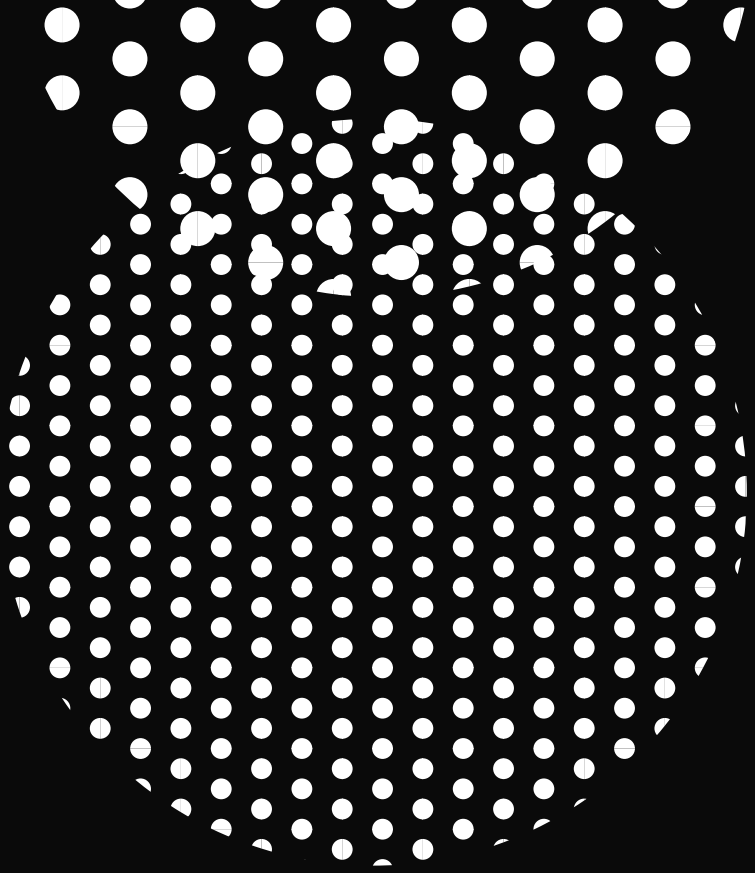
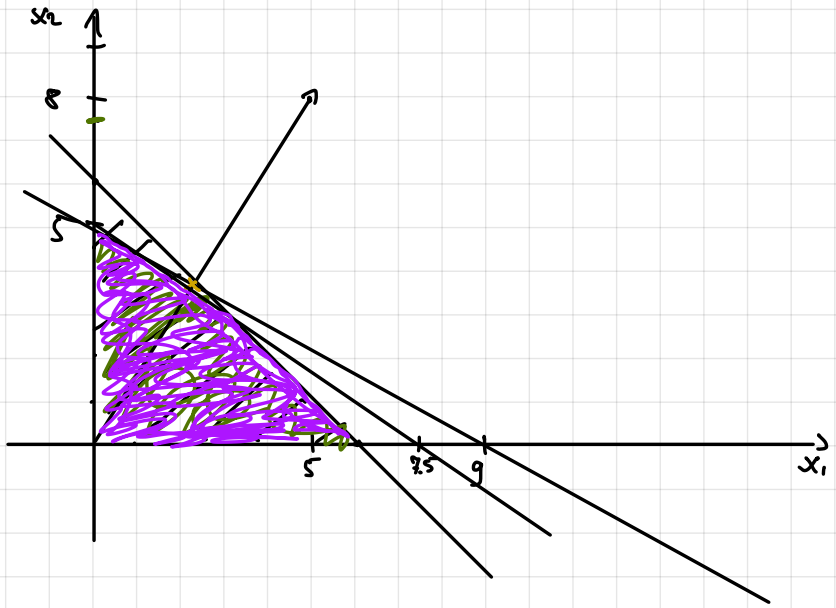


Exercice 1

1)



2) $\begin{cases} \max \quad z = 5x_1 + 8x_2 + 0x_3 + 0x_4 \\ x_1 + x_2 + x_3 = 6 \\ 5x_1 + 9x_2 + x_4 = 45 \\ x_1, x_2, x_3, x_4 \geq 0 \end{cases}$

	x_1	x_2	x_3	x_4	b_i	
Δ	5	8	0	0	0	
x_3	1	1	1	0	6	$\frac{6}{1}$
x_4	5	9	0	1	45	$\frac{45}{9} = 5$ ← min

	x_1	x_2	x_3	x_4	b_i	
Δ	$\frac{5}{9}$	0	0	$-\frac{8}{9}$	-40	
x_3	$\frac{4}{9}$	0	1	$-\frac{1}{9}$	$1 = \frac{9}{4}$	← min
x_2	$\frac{5}{9}$	1	0	$\frac{1}{9}$	5	$= 5$

	x_1	x_2	x_3	x_4	b_i
Δ	0	0	$-\frac{5}{4}$	$-\frac{9}{4}$	$-\frac{165}{4}$
x_1	1	0	$\frac{9}{4}$	$-\frac{1}{4}$	$\frac{9}{4}$
x_2	0	1	$-\frac{5}{4}$	$\frac{1}{4}$	$\frac{15}{4}$

Sinon

3. $x_2 - \frac{5}{4}x_3 + \frac{1}{4}x_4 = \frac{15}{4}$

$(1+0)x_2 + (-2+\frac{3}{4}) + (0+\frac{1}{4})x_4 = (3+\frac{3}{4})$

$f_j \geq 0$

Coupe de Gaumory

$\frac{3}{4}x_3 + \frac{1}{4}x_4 \geq \frac{3}{4} \Rightarrow 8x_1 + 12x_2 \leq 60$

$x_3 = 6 - x_1 - x_2$

$\frac{3}{4}(\overbrace{6-x_1-x_2}^{=x_3}) + \frac{1}{4}(\overbrace{45-5x_1-9x_2}^{=x_4}) \geq \frac{3}{4}$

$-18 + 3x_1 + 3x_2 + 5x_1 + 9x_2 - 45 \leq 3$

$\Leftrightarrow 8x_1 + 12x_2 \leq 60$

Sol entière : $(0,5)$

	x_1	x_2	x_3	x_4	S	b_i
1	0	0	$-\frac{5}{4}$	$-\frac{3}{4}$	0	$-\frac{165}{4}$
x_1	1	0	$\frac{5}{4}$	$-\frac{1}{4}$	0	$\frac{9}{4}$
x_2	0	1	$-\frac{5}{4}$	$\frac{1}{4}$	0	$\frac{15}{4}$
S			$-\frac{3}{4}$	$-\frac{1}{4}$	1	$-\frac{3}{4}$