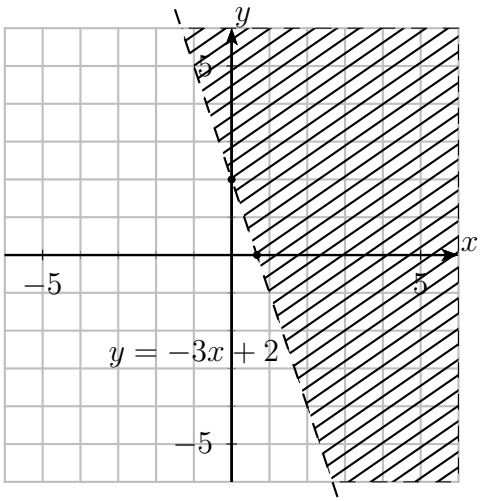
Chapitre 1(1) : Programmation linéaire

Série A

Exercice 1. (4 pts)

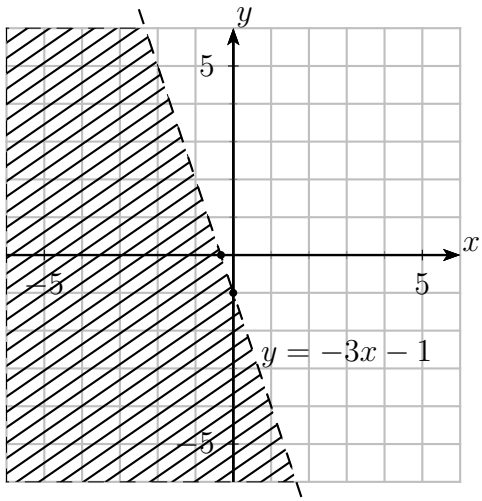
$3x + y > 2$



Origine : $0 + 0 > 2$ FAUX
L'origine $\notin$ au demi-plan solution.

Série B

$3x + y < -1$

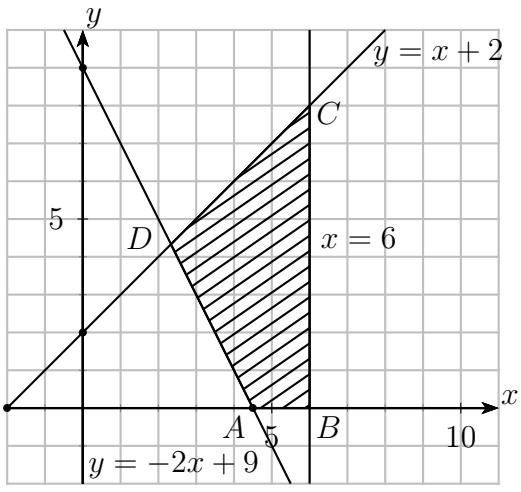


Origine : $0 + 0 < -1$ FAUX
L'origine $\notin$ au demi-plan solution.

Exercice 2. (6+4=10 pts)

$$\begin{cases} -x + y \leq 2 \\ 2x + y \geq 9 \\ x \leq 6 \\ y \geq 0 \end{cases}$$

a)



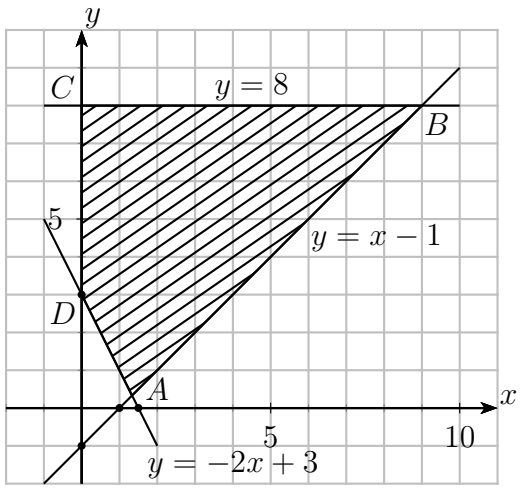
b) $A(4.5\,;0)$

$B(6\,;0)$

$C(6\,;8)$

$\begin{cases} -x + y = 2 \\ 2x + y = 9 \end{cases} \Rightarrow D(7/3\,;13/3)$

$$\begin{cases} -x + y \geq -1 \\ 2x + y \geq 3 \\ x \geq 0 \\ y \leq 8 \end{cases}$$



$\begin{cases} -x + y = -1 \\ 2x + y = 3 \end{cases} \Rightarrow A(4/3\,;1/3)$

$B(9\,;8)$

$C(0\,;8)$

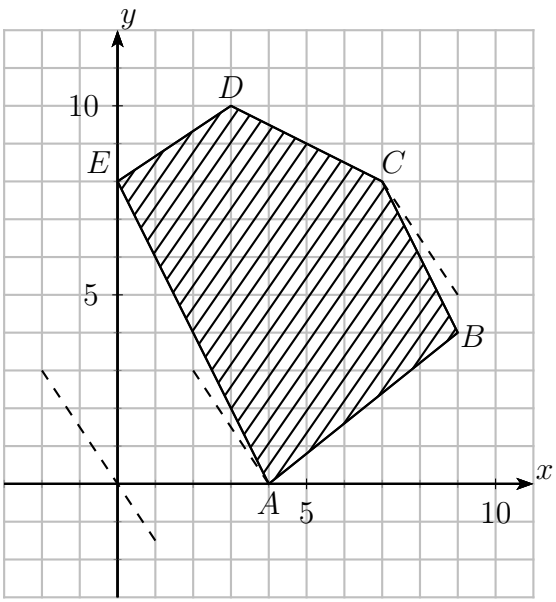
$D(0\,;3)$

Exercice 3. (1+1+2+2=6 pts)

a) $f(x;y) = 3x + 2y \Rightarrow y = -\dfrac{3}{2}\,x + \dfrac{f(x;y)}{2}$

Pente $= -\dfrac{3}{2}$

b)



c) $C(7\,;8)$: point maximal

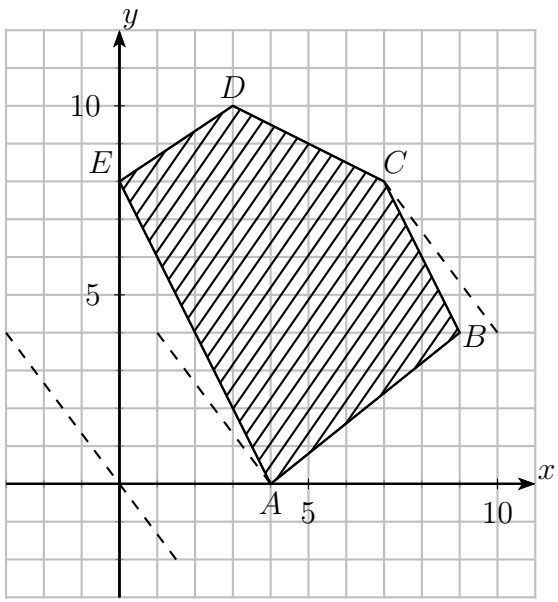
Maximum : $f(7;8) = 3 \cdot 7 + 2 \cdot 8 = 37$

d) $A(4\,;0)$: point minimal

Minimum : $f(4;0) = 3 \cdot 4 + 2 \cdot 0 = 12$

$f(x;y) = 4x + 3y \Rightarrow y = -\dfrac{4}{3}\,x + \dfrac{f(x;y)}{3}$

Pente $= -\dfrac{4}{3}$



$C(7\,;8)$: point maximal

Maximum : $f(7;8) = 4 \cdot 7 + 3 \cdot 8 = 52$

$A(4\,;0)$: point minimal

Minimum : $f(4;0) = 4 \cdot 4 + 3 \cdot 0 = 16$