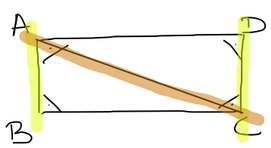
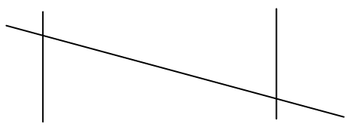
3.1.23

$x = 2y \iff x - 2y = 0$: (AB)

$2y - x = 15 \iff -x + 2y - 15 = 0 \iff x - 2y + 15 = 0$: (CD)

$7x + y = 15 \iff 7x + y - 15 = 0$: (AC)





1) $A = (AB) \cap (AC)$: $\begin{cases} x - 2y = 0 \\ 7x + y = 15 \end{cases} \begin{matrix} \vert 1 \\ \vert 2 \end{matrix} \Rightarrow + \begin{matrix} x - 2y = 0 \\ 14x + 2y = 30 \end{matrix}$

$15x = 30$

$x = 2$

(1°) $\Rightarrow 2 - 2y = 0$

$y = 1 \Rightarrow A(2;1)$

2) $C = (CD) \cap (AC)$:

$\begin{cases} x - 2y = -15 \\ 7x + y = 15 \end{cases} \begin{matrix} \vert 1 \\ \vert 2 \end{matrix} \Rightarrow \begin{matrix} x - 2y = -15 \\ 14x + 2y = 30 \end{matrix}$

$15x = 15$

$x = 1$ (1°) $\Rightarrow 1 - 2y = -15$

$-2y = -16$

$y = 8$

$\Rightarrow C(1;8)$

3) $(BC) \perp (AB) \Rightarrow 2x + y + c = 0$ (x − 2y = 0)

$C \in (BC) \Rightarrow 2 \cdot 1 + 8 + c = 0 \iff c = -10$

$\Rightarrow (BC) : 2x + y - 10 = 0$

$B = (AB) \cap (BC)$: $\begin{cases} x - 2y = 0 \\ 2x + y = 10 \end{cases} \begin{matrix} \vert 1 \\ \vert 2 \end{matrix} \Rightarrow \begin{matrix} x - 2y = 0 \\ 4x + 2y = 20 \end{matrix}$

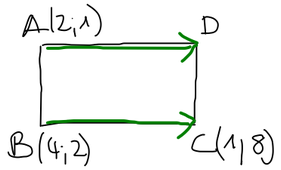
$5x = 20$

$x = 4$

(1°) $\Rightarrow 4 - 2y = 0$

$y = 2 \Rightarrow B(4;2)$

4)



pour D idem 3)

$\overrightarrow{OD} = \overrightarrow{OA} + \overrightarrow{AD} = \overrightarrow{OA} + \overrightarrow{BC} = \begin{pmatrix} 2 \\ 1 \end{pmatrix} + \begin{pmatrix} 1-4 \\ 8-2 \end{pmatrix} = \begin{pmatrix} -1 \\ 7 \end{pmatrix}$

car // -gramme

$\Rightarrow D(-1;7)$