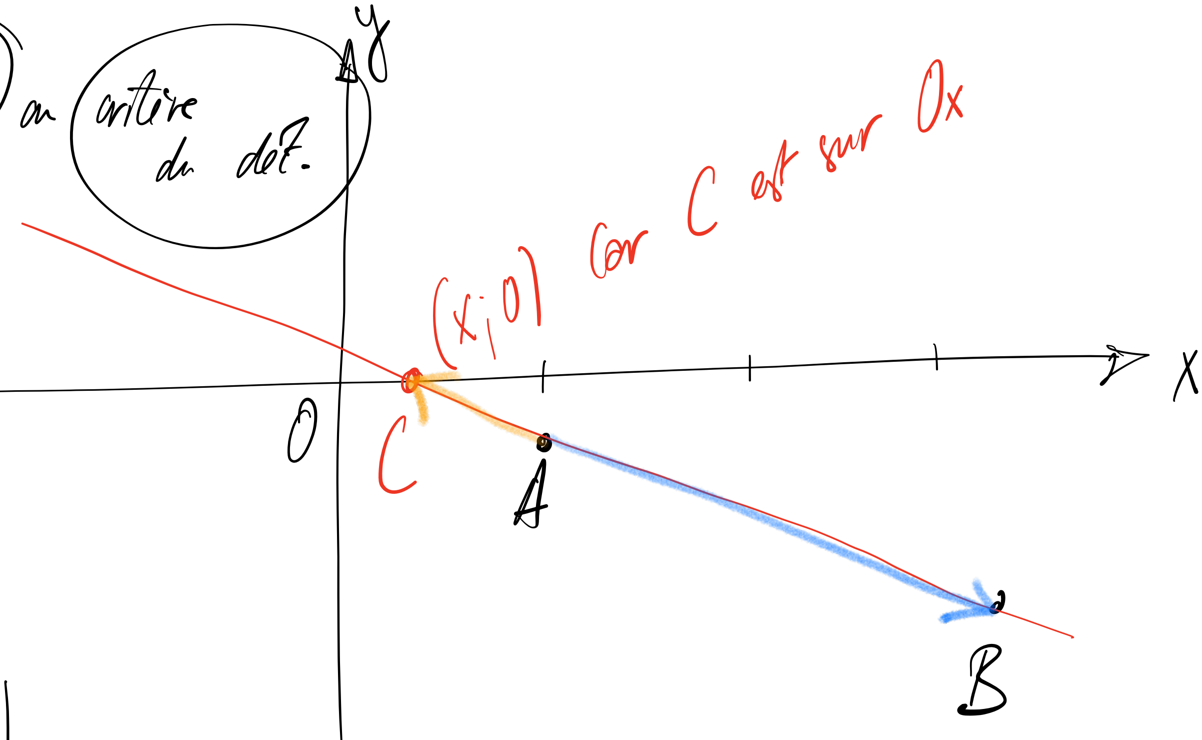
$\boxed{1.3.14}$

$A(7;-3)$ $B(23;-6)$

$\overrightarrow{AB} = k\overrightarrow{AC}$ ou critère du dét.

$\overrightarrow{AB} = \begin{pmatrix} 16 \\ -3 \end{pmatrix}$



$\overrightarrow{AC} = \begin{pmatrix} x-7 \\ 3 \end{pmatrix}$

$$\begin{vmatrix} 16 & x-7 \\ -3 & 3 \end{vmatrix} = 0$$

$$48 + 3\cdot(x-7) = 0 \iff 48 + 3x - 21 = 0$$

$$\iff 3x = -27$$

$$x = -9$$

$$\Rightarrow C(-9;0)$$

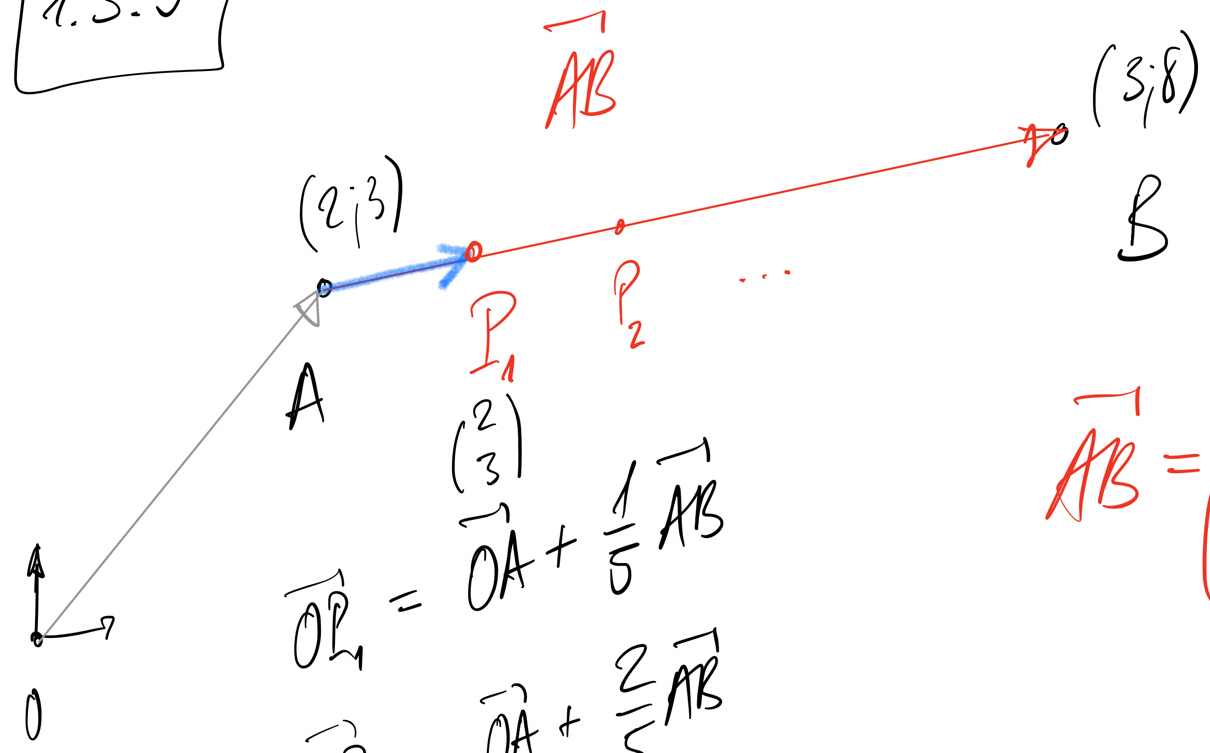
Calculer les coordonnées du milieu M de deux points A et B :

$$\overrightarrow{OM} = \frac{1}{2}\left(\overrightarrow{OA} + \overrightarrow{OB}\right) = \overrightarrow{OA} + \frac{1}{2}\overrightarrow{AB}$$

Calculer les coordonnées du centre de gravité G de trois points A, B et C :

$$\overrightarrow{OG} = \frac{1}{3}\left(\overrightarrow{OA} + \overrightarrow{OB} + \overrightarrow{OC}\right)$$

1.3.9



$$\overrightarrow{AB} = \begin{pmatrix} b_1 - a_1 \\ b_2 - a_2 \end{pmatrix}$$

$$\overrightarrow{OP_1} = \underset{\binom{2}{3}}{\overrightarrow{OA}} + \frac{1}{5}\overrightarrow{AB}$$

$$\overrightarrow{OP_2} = \overrightarrow{OA} + \frac{2}{5}\overrightarrow{AB}$$

$\vdots$

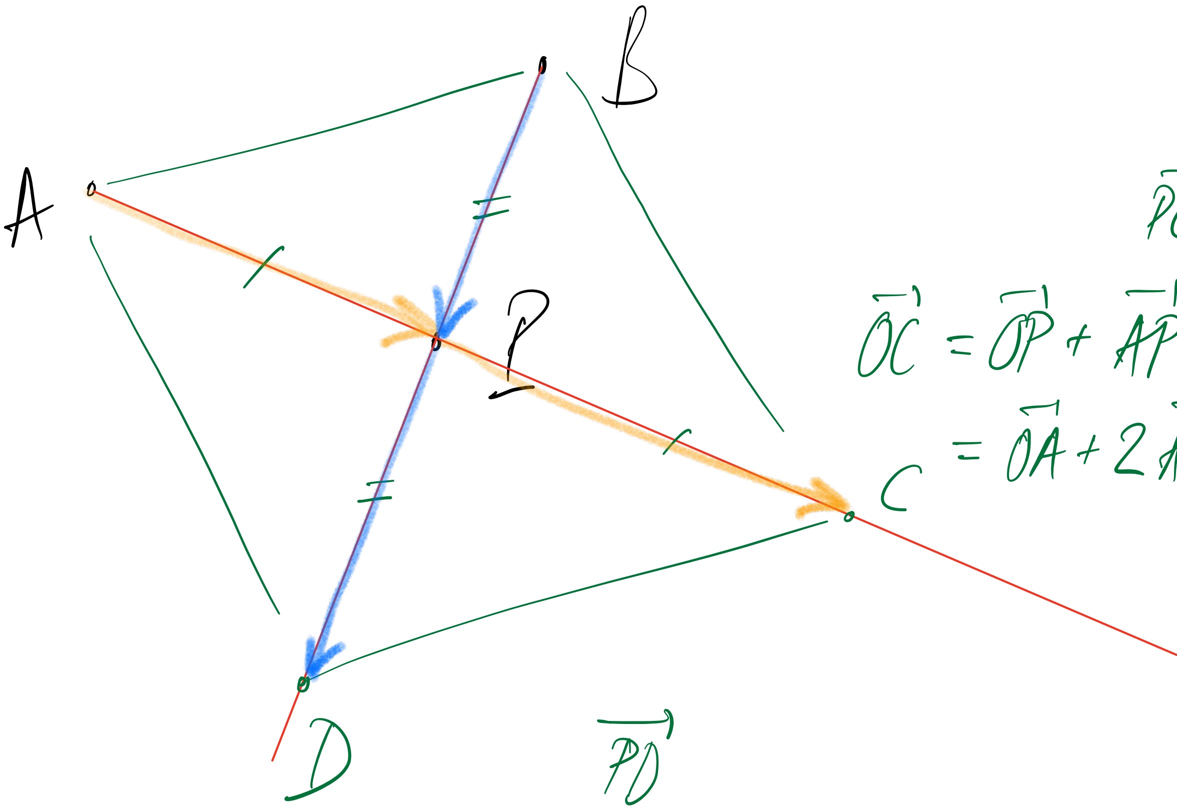
1.3.12

$A(1;2)$ $B(-3;3)$ $C(k;1)$

$$\overrightarrow{AB} = \begin{pmatrix} -4 \\ 1 \end{pmatrix} \qquad \overrightarrow{AC} = \begin{pmatrix} k-1 \\ -1 \end{pmatrix}$$

$\overrightarrow{AB}$ et $\overrightarrow{AC}$ alignés $\Leftrightarrow$ $\begin{vmatrix} -4 & k-1 \\ 1 & -1 \end{vmatrix} = 0$

$4 - 1\cdot(k-1) = 0 \Rightarrow k = \ldots$



$\overrightarrow{PC}$

$$\overrightarrow{OC} = \overrightarrow{OP} + \overrightarrow{AP}$$
$$= \overrightarrow{OA} + 2\,\overrightarrow{AP}$$

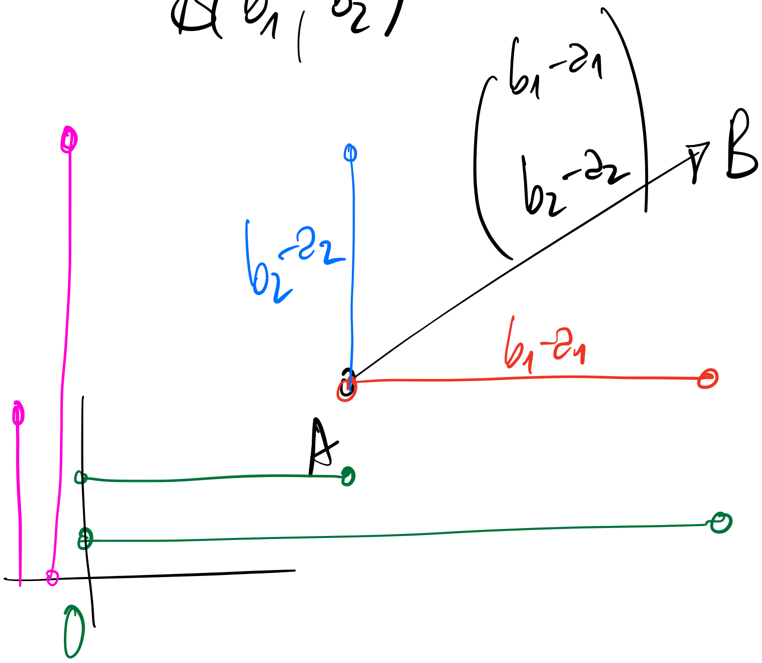
$\overrightarrow{PD}$

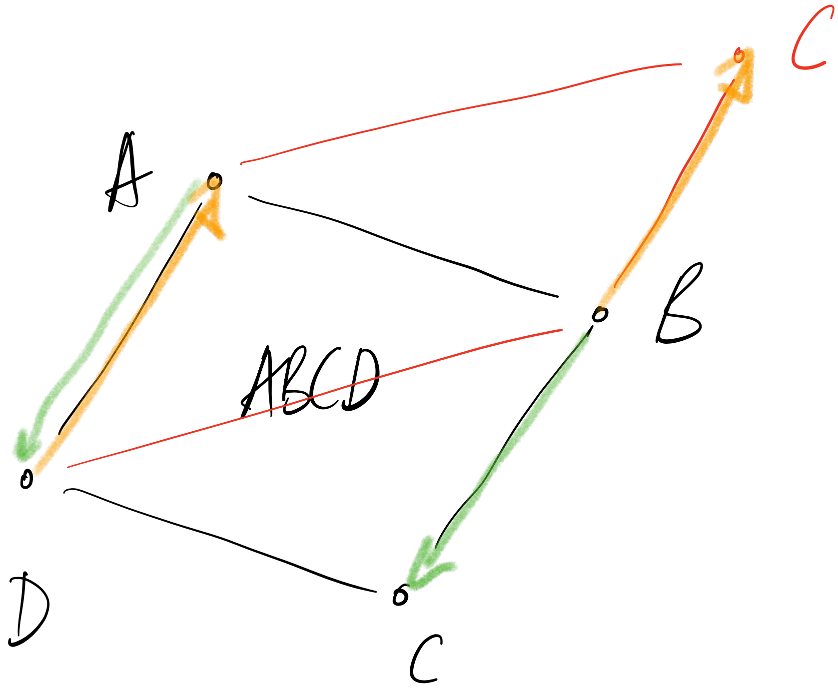
$$\overrightarrow{OD} = \overrightarrow{OP} + \overrightarrow{BP} = \overrightarrow{OB} + 2 \cdot \overrightarrow{BP}$$

$A(a_1; a_2)$

$B(b_1; b_2)$

$$\vec{AB} = \begin{pmatrix} b_1 - a_1 \\ b_2 - a_2 \end{pmatrix}$$




C
A
B
ABCD
D
C