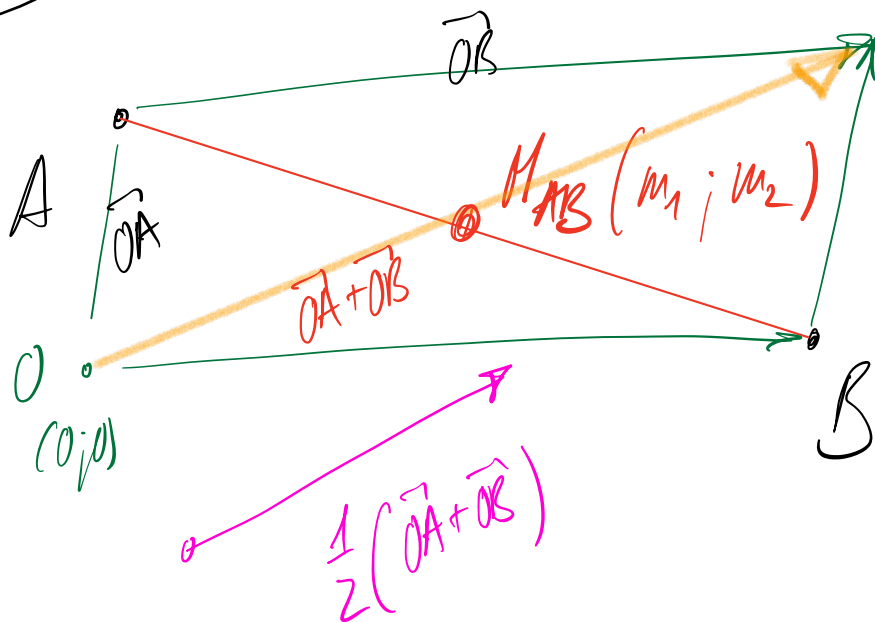


MILIEU

$$\vec{OM}_{AB} = \frac{1}{2} (\vec{OA} + \vec{OB})$$



Example: $A = (1; 2; 3)$ $B = (-5; 4; -3)$

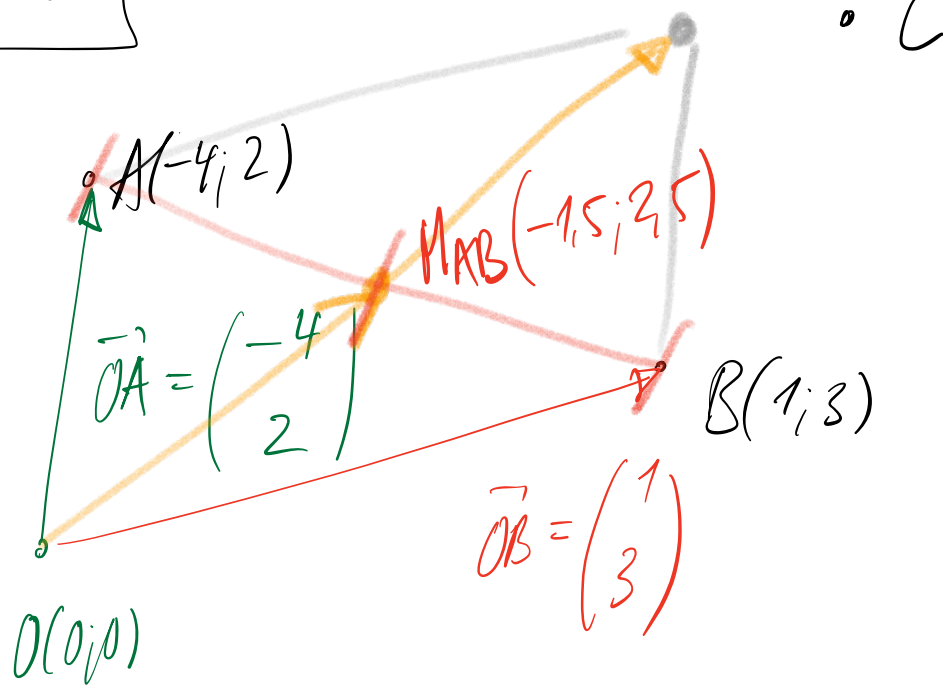
$$\vec{OA} = \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix} \quad \vec{OB} = \begin{pmatrix} -5 \\ 4 \\ -3 \end{pmatrix}$$

$$M_{AB} = (-2; 3; 0)$$

$$\vec{OM} = \frac{1}{2} \left(\begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix} + \begin{pmatrix} -5 \\ 4 \\ -3 \end{pmatrix} \right)$$

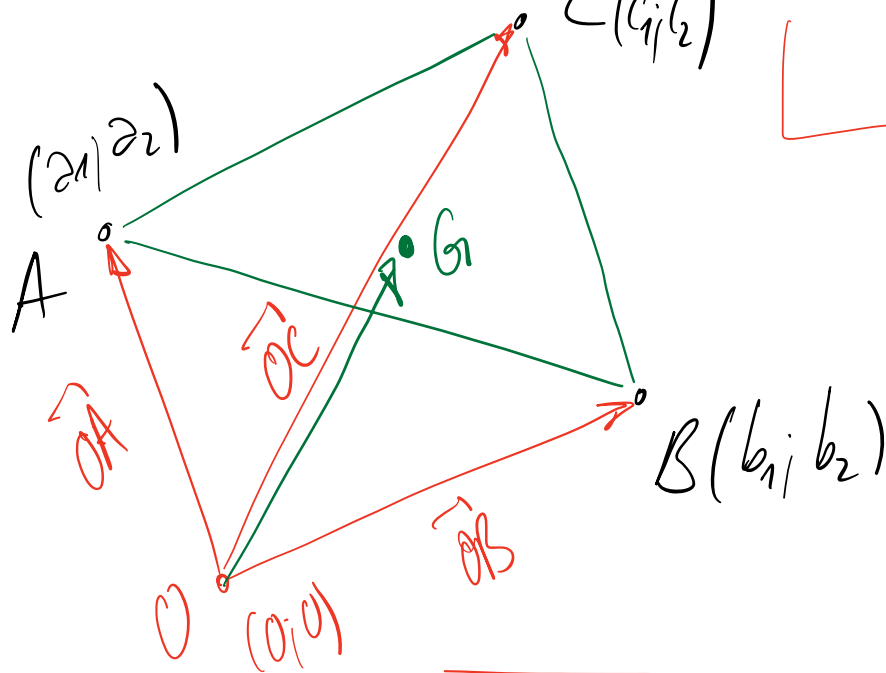
$$= \frac{1}{2} \begin{pmatrix} -4 \\ 6 \\ 0 \end{pmatrix} = \begin{pmatrix} -2 \\ 3 \\ 0 \end{pmatrix}$$

1.3.19



$$\begin{aligned} \vec{OM}_{AB} &= \frac{1}{2} (\vec{OA} + \vec{OB}) = \frac{1}{2} \begin{pmatrix} -4+1 \\ 2+3 \end{pmatrix} \\ &= \frac{1}{2} \begin{pmatrix} -3 \\ 5 \end{pmatrix} = \begin{pmatrix} -3/2 \\ 5/2 \end{pmatrix} \end{aligned}$$

CENTRE DE GRAVITÉ



$$\vec{OG} = \frac{1}{3}(\vec{OA} + \vec{OB} + \vec{OC})$$

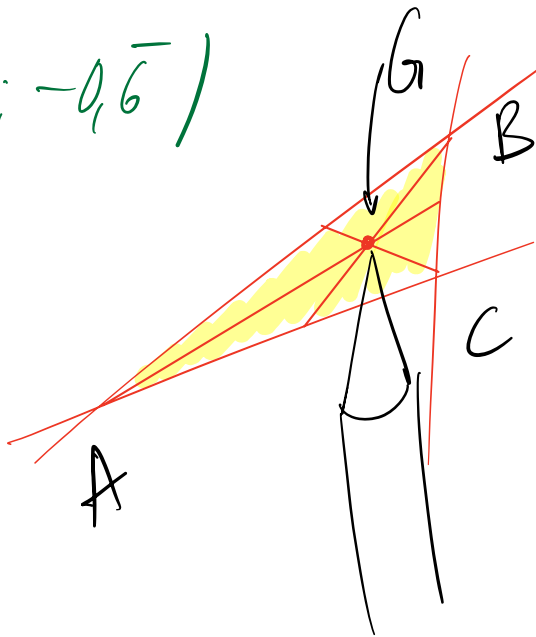
$$G = \left(\frac{a_1 + b_1 + c_1}{3} ; \frac{a_2 + b_2 + c_2}{3} \right)$$

Example: $A = (1; 2; 3)$ $B = (-5; 4; -3)$

$$C = (-1; 2; -2)$$

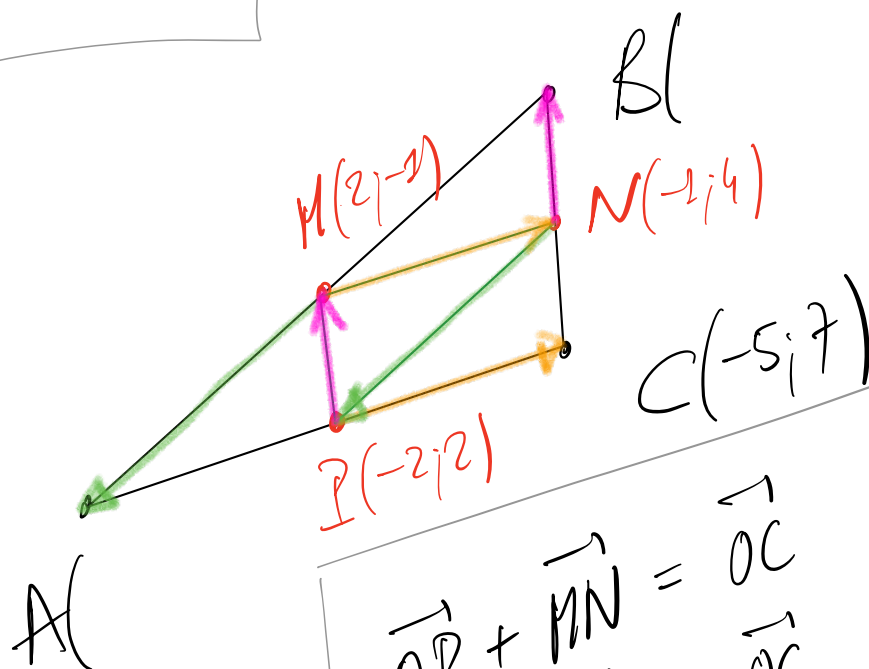
$$G = \left(\frac{1-5-1}{3} ; \frac{2+4+2}{3} ; \frac{3-3-2}{3} \right)$$

$$G = (-1,6; 2,6; -0,6)$$



$$\vec{P} + \vec{MN} = \vec{C}$$

1.3.18



$$C(-5; 7)$$

$$\vec{OP} + \vec{MN} = \vec{OC}$$

$$\vec{OP} + \vec{PC} = \vec{OC}$$

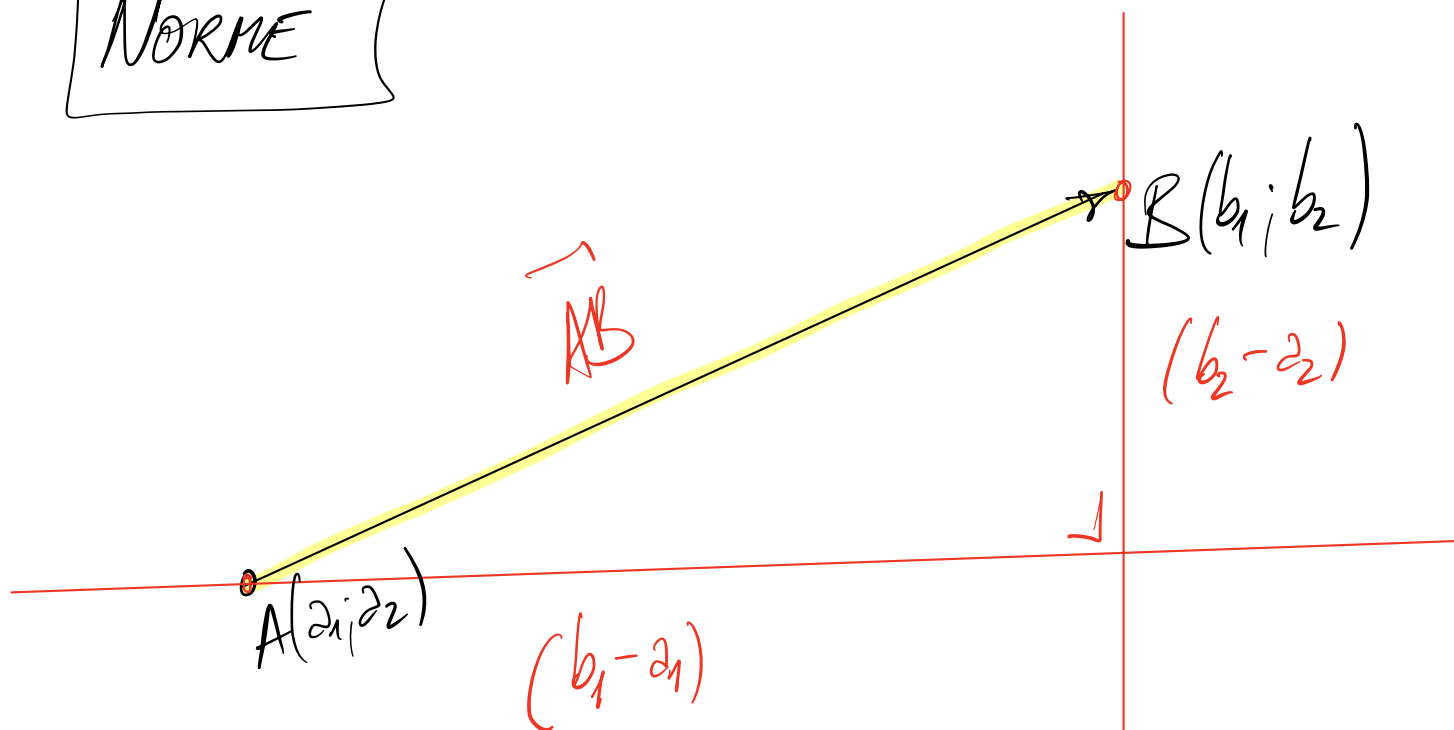
$$\vec{MN} = \vec{PC}$$

$$\vec{MN} = \begin{pmatrix} n_1 - m_1 \\ n_2 - m_2 \end{pmatrix}$$

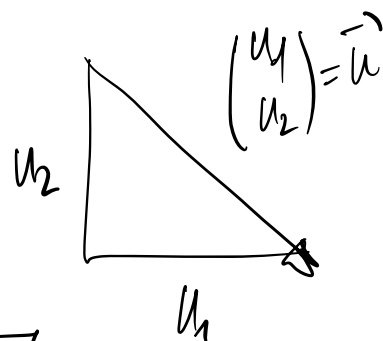
$$\begin{pmatrix} -2 \\ 2 \end{pmatrix} + \begin{pmatrix} -1-2 \\ 4-(-4) \end{pmatrix} = \begin{pmatrix} -2 \\ 2 \end{pmatrix} + \begin{pmatrix} -3 \\ 5 \end{pmatrix}$$

$$\vec{OP} + \vec{MN} = \begin{pmatrix} -5 \\ 7 \end{pmatrix}$$

NORME



$$\|\vec{AB}\| = \sqrt{(b_1 - a_1)^2 + (b_2 - a_2)^2}$$



$$\vec{u} = \begin{pmatrix} u_1 \\ u_2 \end{pmatrix}$$

$$\|\vec{u}\| = \sqrt{u_1^2 + u_2^2}$$

Exemple: $\vec{u} = \begin{pmatrix} 3 \\ 4 \end{pmatrix}$

$$\|\vec{u}\| = \sqrt{3^2 + 4^2}$$

$$= \sqrt{9 + 16} = \sqrt{25} = 5$$

$$\vec{v} = \begin{pmatrix} 5 \\ 12 \end{pmatrix}$$

$$\|\vec{v}\| = \sqrt{5^2 + 12^2} = \sqrt{25 + 144}$$

$$= \sqrt{169} = 13$$

$$\vec{x} = \begin{pmatrix} -7 \\ 8 \end{pmatrix}$$

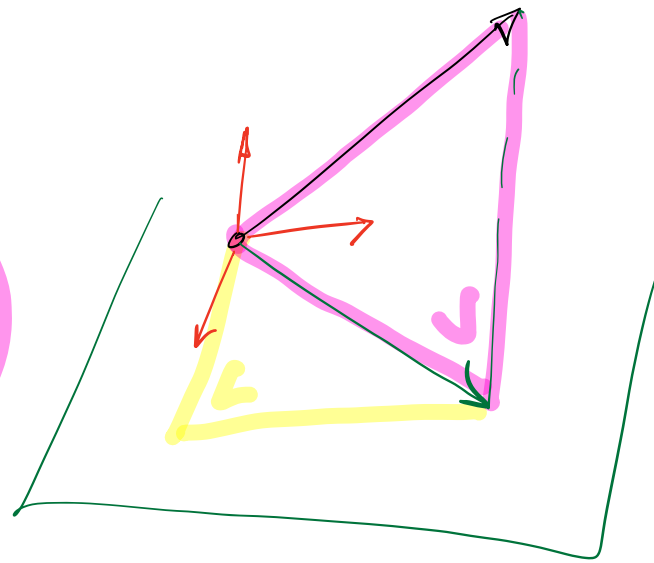
$$\|\vec{x}\| = \sqrt{(-7)^2 + 8^2}$$

$$= \sqrt{49 + 64} = \sqrt{113}$$

$$\approx 10,63$$

$$\vec{w} = \begin{pmatrix} w_1 \\ w_2 \\ w_3 \end{pmatrix}$$

$$\|\vec{w}\| = \sqrt{w_1^2 + w_2^2 + w_3^2}$$



1.4.1

$$e) \quad \left\| \begin{pmatrix} 2 \\ 3 \end{pmatrix} + m \begin{pmatrix} -2 \\ 4 \end{pmatrix} \right\| = \sqrt{82}$$

$$\left\| \begin{pmatrix} 2-2m \\ 3+4m \end{pmatrix} \right\| = \sqrt{82}$$

$$\sqrt{(2-2m)^2 + (3+4m)^2} = \sqrt{82}$$

$$(2-2m)^2 + (3+4m)^2 = 82$$

$\downarrow$ $()^2$