

L1P: TE 4 GEOMETRIE PLANE

EXERCICE 1

$f: 4x - y - 10 = 0$ $E(4;6)$ $A(-1;3)$ $C(1;7)$ $B(-2;5)$

1. $\vec{n}_f = \begin{pmatrix} 4 \\ -1 \end{pmatrix} \Rightarrow \vec{d}_f = \begin{pmatrix} 1 \\ 4 \end{pmatrix}$

2. $P \perp f$ $A \in P$ $\vec{d}_P = \vec{n}_f = \begin{pmatrix} 4 \\ -1 \end{pmatrix}$ $P: \begin{cases} x = -1 + 4\lambda \\ y = 3 - \lambda \end{cases}$

3. $\vec{n}_P = \vec{d}_f = \begin{pmatrix} 1 \\ 4 \end{pmatrix} \Rightarrow P: x + 4y + C = 0$

$A: -1 + 12 + C = 0 \Rightarrow C = -11$

$P: x + 4y - 11 = 0$

4. $\vec{AB} = \begin{pmatrix} -1 \\ 2 \end{pmatrix}$ $\vec{AC} = \begin{pmatrix} 2 \\ 4 \end{pmatrix}$ $\vec{AB} \cdot \vec{AC} = -2 + 8 = 6$

5. $\cos A = \frac{\vec{AB} \cdot \vec{AC}}{\|\vec{AB}\| \cdot \|\vec{AC}\|} = \frac{6}{\sqrt{5} \cdot \sqrt{20}} \Rightarrow A = 53.13^\circ$

6. $\det(\vec{AB}, \vec{AC}) = \begin{vmatrix} -1 & 2 \\ 2 & 4 \end{vmatrix} = -4 - 4 = -8$

$Aire = \frac{1}{2} |-8| = 4$

7. $\text{dist}(C, f) = \frac{|4 - 7 - 10|}{\sqrt{17}} = \frac{13}{\sqrt{17}}$

8. $A_{AA'E} = \frac{B \cdot h}{2} = \frac{AA' \cdot A'E}{2}$

$AA' = \text{dist}(A, f) = \frac{|-4 - 3 - 10|}{\sqrt{17}} = \frac{17}{\sqrt{17}} = \sqrt{17}$

$A'E = \text{dist}(E, P) = \frac{|4 + 24 - 11|}{\sqrt{17}} = \frac{17}{\sqrt{17}} = \sqrt{17}$

$A = \frac{1}{2} \sqrt{17}^2 = \frac{17}{2}$

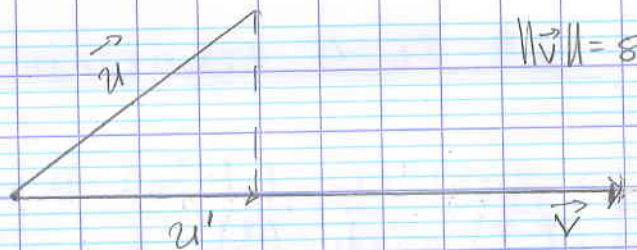
9. $q \parallel f \Rightarrow q: 4x - y + C = 0$

$\text{dist}(f, q) = 3 \Rightarrow \text{dist}(E, q) = 3 \Rightarrow \frac{|16 - 6 + C|}{\sqrt{17}} = 3 \Rightarrow$

$\Rightarrow |C + 10| = 3\sqrt{17} \Rightarrow \begin{cases} C_1 = 3\sqrt{17} - 10 \\ C_2 = -3\sqrt{17} - 10 \end{cases}$

$q_1: 4x - y + 3\sqrt{17} - 10 = 0$ $q_2: 4x - y - 3\sqrt{17} - 10 = 0$

EXERCICE 2



$$\|\vec{v}\| = 8 \quad u' = 3.2$$

$$\vec{u} \cdot \vec{v} = \|\vec{v}\| \cdot u' \Rightarrow \vec{u} \cdot \vec{v} = 8 \cdot 3.2 \Rightarrow \vec{u} \cdot \vec{v} = 25.6$$