

LDDR Niveau 1: TE 12 GEOMETRIE PLANE

EXERCICE 1.

1. $\vec{U} + \vec{V} = 4\vec{U} \Rightarrow \vec{V} = 3\vec{U} \Rightarrow \vec{U} = \frac{1}{3}\vec{V} \quad (4)$

2. $\vec{BC} = \vec{AD}$

3. $\vec{AI} = \frac{1}{2}\vec{AB}$

EXERCICE 2.



$A(2;3) \quad B(0;-3) \quad C(-3;0)$

1. $G = \left(\frac{2+0+(-3)}{3}; \frac{3+(-3)+0}{3} \right) \Rightarrow G \left(-\frac{1}{3}; 0 \right)$

2. $\vec{AB} = \begin{pmatrix} -2 \\ -6 \end{pmatrix} \quad \vec{AC} = \begin{pmatrix} -5 \\ -3 \end{pmatrix} \quad \begin{vmatrix} -2 & -5 \\ -6 & -3 \end{vmatrix} = 6 - 30 = -24$

Aire = $\frac{1}{2} |-24| = 12$

3. $\vec{BE} = \frac{1}{2}\vec{AB} \Rightarrow \vec{BE} = \begin{pmatrix} -1 \\ -3 \end{pmatrix} \Rightarrow \begin{pmatrix} x \\ y+3 \end{pmatrix} = \begin{pmatrix} -1 \\ -3 \end{pmatrix} \Rightarrow \begin{matrix} x = -1 \\ y = -6 \end{matrix}$

$E(-1; -6)$

$\vec{BF} = \frac{2}{3}\vec{OF} \Rightarrow \begin{pmatrix} x \\ y+3 \end{pmatrix} = \frac{2}{3} \begin{pmatrix} x \\ y \end{pmatrix} \Rightarrow \begin{matrix} x = \frac{2}{3}x \Rightarrow \frac{1}{3}x = 0 \Rightarrow x = 0 \\ y+3 = \frac{2}{3}y \Rightarrow \frac{1}{3}y = -3 \Rightarrow y = -9 \end{matrix}$

$F(0; -9)$

4. $\vec{CE} = \begin{pmatrix} 2 \\ -6 \end{pmatrix}$

EXERCICE 3.



$A(-13;3) \quad B(5;-1) \quad C(-10;-6)$

1. $\vec{AC} = \begin{pmatrix} 3 \\ -9 \end{pmatrix} \quad \vec{BC} = \begin{pmatrix} -15 \\ -5 \end{pmatrix}$

$\vec{AC} \cdot \vec{BC} = -45 + 45 = 0 \Rightarrow \vec{AC} \perp \vec{BC}$

2. $\vec{DF} = \frac{3}{2}\vec{AB} - 3\vec{AC} = \frac{3}{2} \begin{pmatrix} 18 \\ -4 \end{pmatrix} - 3 \begin{pmatrix} 3 \\ -9 \end{pmatrix} = \begin{pmatrix} 27 \\ -6 \end{pmatrix} - \begin{pmatrix} 9 \\ -27 \end{pmatrix} = \begin{pmatrix} 18 \\ 21 \end{pmatrix}$

$\vec{DE} = \vec{AB} - 2\vec{AC} = \begin{pmatrix} 18 \\ -4 \end{pmatrix} - 2 \begin{pmatrix} 3 \\ -9 \end{pmatrix} = \begin{pmatrix} 12 \\ 14 \end{pmatrix}$

$\vec{DF} \parallel \begin{pmatrix} 6 \\ 7 \end{pmatrix} \quad \vec{DE} \parallel \begin{pmatrix} 6 \\ 7 \end{pmatrix} \Rightarrow$ sont colinéaires

3. $\vec{x} = \begin{pmatrix} 1 \\ w+1 \end{pmatrix} \parallel \vec{y} = \begin{pmatrix} -3 \\ 2w \end{pmatrix} \Rightarrow \begin{vmatrix} 1 & -3 \\ w+1 & 2w \end{vmatrix} = 0 \Rightarrow$

$\Rightarrow 2w + 3w + 3 = 0 \Rightarrow 5w + 3 = 0 \Rightarrow w = -\frac{3}{5}$