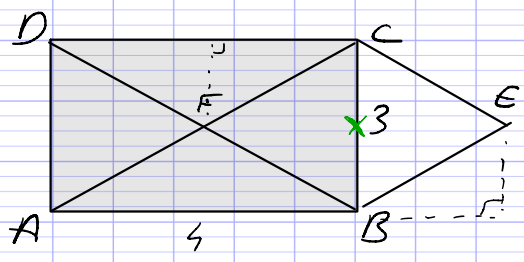
DS6 - Produit Scalaire

(6) ⇒ Exercice n°1

1°/



2°/ $\vec{BA} \cdot \vec{BE} = -4 \times 2 = -8$

$\vec{CF} \cdot \vec{CD} = 4 \times 2 = 8$

$\vec{AF} \cdot \vec{AB} = 4 \times 2 = 8$

$\vec{AB} \cdot \vec{BE} = 8$

$\vec{BF} \cdot \vec{DC} = -4 \times 2 = -8$

(6) ⇒ Exercice n°2

1°/ $\vec{AB} \cdot \vec{AC} = AB \times AC \times \cos(\widehat{BAC})$

$= 5 \times 4 \times \cos(45°)$

$= 10\sqrt{2}$

2°/ $\vec{AB} \cdot \vec{AC} = \vec{AH} \cdot \vec{AC}$

$= AH \times AC$

$= 4 \times 7$

$= 28$

// $HC = \sqrt{5^2 - 4^2}$

$= 3$

3°/ $\vec{AB}\begin{pmatrix} 5+3 \\ -1+2 \end{pmatrix} \Leftrightarrow \vec{AB}\begin{pmatrix} 7 \\ 1 \end{pmatrix}$ et $\vec{AC}\begin{pmatrix} 1+3 \\ 2+2 \end{pmatrix} \Leftrightarrow \vec{AC}\begin{pmatrix} 4 \\ 4 \end{pmatrix}$

$\vec{AB}\cdot\vec{AC} = xx' + yy'$

$= 7\times 4 + 1\times 4$

$= 28 + 4$

$= 32$

(8) $\Rightarrow$ Exercice n°3

1°/ $\vec{AB}\cdot\vec{AC} = \vec{AB}\cdot\vec{AH}$

$= AB \times AH$

2°/ * $AC^2 = AH^2 + HC^2$

* $CB^2 = AC^2 + HB^2$

$= HC^2 + (AB - AH)^2$

$= HC^2 + AB^2 - 2AB\times AH + AH^2$

3°/ On a $CB^2 = HC^2 + AB^2 - 2AB\times AH + AH^2$

$CB^2 = HC^2 + AB^2 - 2\vec{AB}\cdot\vec{AC} + AH^2$

$2\vec{AB}\cdot\vec{AC} = HC^2 + AB^2 + AH^2 - CB^2$

$2\vec{AB}\cdot\vec{AC} = AC^2 + AB^2 - CB^2$

$\vec{AB}\cdot\vec{AC} = \frac{1}{2}(AB^2 + AC^2 - BC^2)$

4°/ $2\vec{AB}\cdot\vec{AC} = AB^2 + AC^2 - BC^2$

$BC^2 = AB^2 + AC^2 - 2\vec{AB}\cdot\vec{AC}$

$BC^2 = AB^2 + AC^2 - 2\times AB\times AC\times \cos(\widehat{BAC})$