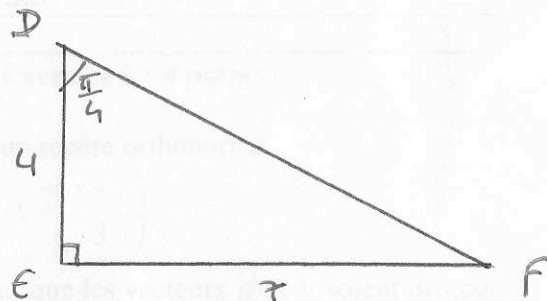


Correction de l'exercice 2

exo 1



$$1. \vec{DE} \cdot \vec{DF} = DE \times DF \times \cos(\widehat{EDF})$$

$$DE = 4$$

$$DF^2 = DE^2 + EF^2$$

$$DF^2 = 4^2 + 7^2$$

$$DF^2 = 16 + 49$$

$$DF^2 = 65$$

$$DF = \sqrt{65}$$

$$\text{Dmc } \vec{DE} \cdot \vec{DF} = 4 \times \sqrt{65} \times \cos \frac{\pi}{4}$$

$$= 4\sqrt{65} \cdot \frac{\sqrt{2}}{2}$$

$$= 2\sqrt{130}$$

$$2. a. \vec{AB} \cdot \vec{AC} = \frac{1}{2} [AB^2 + AC^2 - BC^2]$$

$$= \frac{1}{2} [2^2 + 3^2 - 4^2]$$

$$= \frac{1}{2} [4 + 9 - 16]$$

$$= -\frac{3}{2}$$

$$b. \vec{AB} \cdot \vec{AC} = AB \times AC \cdot \cos(\widehat{BAC})$$

$$-\frac{3}{2} = 2 \times 3 \cdot \cos(\widehat{BAC})$$

$$\text{Dmc } \cos(\widehat{BAC}) = -\frac{1}{4}$$

$$\widehat{BAC} \approx 104,5^\circ$$

exo 2

$$1. \vec{TR} \cdot \vec{ST} = \vec{TH} \cdot \vec{ST}$$

$$= -TH \times ST$$

$$= -2 \times 10$$

$$= -20$$

$$2. \vec{SR} \cdot \vec{ST} = \vec{SH} \cdot \vec{ST}$$

$$= 8 \times 10$$

$$= 80$$

$$3. \vec{SR} \cdot \vec{ST} = SR \times ST \times \cos(\widehat{RST})$$

$$80 = 4\sqrt{5} \times 10 \cdot \cos(\widehat{RST})$$

$$\cos(\widehat{RST}) = \frac{80}{40\sqrt{5}}$$

$$\widehat{RST} \approx 26,57^\circ$$

$$4. \vec{RT} \cdot \vec{RS} = 0 \quad \text{car } (RT) \perp (RS)$$

exo 3

$$1. \vec{u} \perp \vec{v} \Leftrightarrow x(x+2) + (-1) \times 3 = 0$$

$$x^2 + 2x - 3 = 0$$

$$\Delta = 2^2 - 4 \times (-3)$$

$$\Delta = 16 > 0$$

$$x_1 = \frac{-2 - \sqrt{16}}{2}$$

$$x_1 = \frac{-2 - 4}{2}$$

$$\boxed{x_1 = -3}$$

$$x_2 = \frac{-2 + 4}{2}$$

$$\boxed{x_2 = 1}$$

$$2. a. \vec{BA} \begin{pmatrix} x+1 \\ 1 \end{pmatrix} \vec{CA} \begin{pmatrix} x-2 \\ -4 \end{pmatrix}$$

$$b. \vec{BA} \cdot \vec{CA} = 0$$

$$(x+1)(x-2) - 4 = 0$$

$$x^2 - x - 6 = 0$$

$$\Delta = 25 > 0$$

$$\boxed{x_1 = 3} \quad \text{ou} \quad \boxed{x_2 = -2}$$

Exco 4

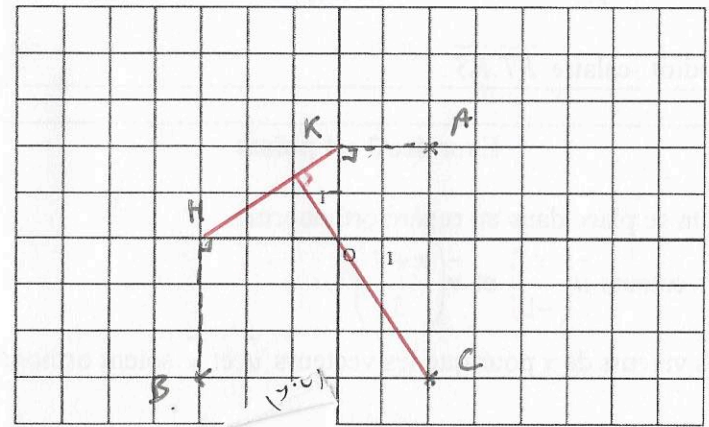
$$\begin{aligned}
 1. \quad \vec{IA} \cdot \vec{IB} &= (\vec{IB} + \vec{DA}) \cdot (\vec{IC} + \vec{CB}) \\
 &= \vec{IB} \cdot \vec{IC} + \vec{IB} \cdot \vec{CB} + \vec{DA} \cdot \vec{IC} + \vec{DA} \cdot \vec{CB} \\
 &= -1 \times 3 + 3 \times 3 \\
 &= 6
 \end{aligned}$$

$$\begin{aligned}
 2. \quad IA^2 &= IO^2 + DA^2 & IB^2 &= IC^2 + CB^2 \\
 IA^2 &= 1^2 + 3^2 & IB^2 &= 3^2 + 3^2 \\
 IA^2 &= 10 & IB^2 &= 18 \\
 IA &= \sqrt{10} & IB &= \sqrt{18}
 \end{aligned}$$

$$\begin{aligned}
 3. \quad \vec{IA} \cdot \vec{IB} &= IA \times IB \times \cos(\widehat{AIB}) \\
 6 &= \sqrt{10} \times \sqrt{18} \times \cos(\widehat{AIB}) \\
 \text{Dmc} \quad \cos(\widehat{AIB}) &= \frac{6}{\sqrt{10} \times \sqrt{18}} = \frac{6}{\sqrt{2} \times \sqrt{5} \times \sqrt{2} \times 3} = \frac{6}{6\sqrt{5}} = \frac{1}{\sqrt{5}}
 \end{aligned}$$

$$4. \quad \widehat{AIB} \approx 63^\circ$$

Exco 5



$$H(-3;0) \quad K(0;2)$$

$$O(0;0) \quad C(2;-3)$$

$$\text{Dmc} \quad \vec{OC} \begin{pmatrix} 2 \\ -3 \end{pmatrix} \text{ et } \vec{HK} \begin{pmatrix} 3 \\ 2 \end{pmatrix}$$

$$\begin{aligned}
 \text{Dmc} \quad \vec{OC} \cdot \vec{HK} &= 2 \times 3 - 3 \times 2 \\
 &= 6 - 6 \\
 &= 0
 \end{aligned}$$

$$\text{Dmc} (OC) \perp (HK)$$