1ºBAC
A/B

1º El triangulo ABC es rectangulo en A siendo sus vertices $A(3,5)$ $B(1,3)$ $C(m,10)$ Calcula $\underline{m}$ el ang $\hat{C}$ y su perimetro
1'5p.

2º a) proy $\vec{u}(2,-5)$ sobre $\vec{v}(5,1)$ 0'5p.

b) Calcula las componentes $\vec{x}$, sabiendo $\vec{x} \perp \vec{u}$ y $\vec{v} \cdot \vec{x} = 1$
$\vec{u}(3,4)$ $\vec{v}(2,-3)$ 1p

3º Calcula los angulos de un trapecio isosceles de $B = 83m$
$b = 51m$ y $h = 60m$ 1p

4º Resuelve $4 \operatorname{sen} \frac{x}{2} + 2\cos x = 3$ 1'5p

5º Simplifica: $\dfrac{\operatorname{sen} 4a + \operatorname{sen} 2a}{\cos 4a + \cos 2a}$ 1'5p

6º Demuestra:

$$\frac{2 \operatorname{sen} a - \operatorname{sen} 2a}{2 \operatorname{sen} a + \operatorname{sen} 2a} = tg^2 \frac{a}{2}$$ 1'5p

7º Calcula y simplifica

$$\frac{\operatorname{sen}(\pi + x) \cdot \cos\left(\frac{\pi}{2} - x\right) - tg \frac{3\pi}{4}}{-\operatorname{sen}\left(\frac{\pi}{2} + x\right) \cdot \cos\left(\frac{3\pi}{2} - x\right)}$$ 1'5.

SAINT LOUIS DES FRANÇAIS

N. Classe

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Note:

① $\vec{AB}\ (-2,-2)$, $\vec{AC}\ (m-3, 5)$

a) $\vec{AB}\cdot\vec{AC} = 0;\ -2m+6-10=0;\ -2m-4=0;\ \boxed{m=-2}$

b) $|\vec{AB}| = \sqrt{4+4} = \sqrt{8}$

$|\vec{AC}| = \sqrt{25+25} = \sqrt{50} = 5\sqrt{2}$

$|\vec{BC}| = \sqrt{9+49} = \sqrt{58}$

Perímetro: $\boxed{\sqrt{8}+\sqrt{50}+\sqrt{58}}$

$\vec{CA}\ (5,-5)$, $\vec{CB}\ (3,-7)$

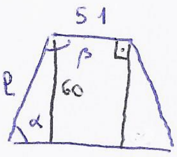
c) $\cos C = \dfrac{\vec{CA}\cdot\vec{CB}}{|\vec{CA}||\vec{CB}|} = \dfrac{50}{\sqrt{50}\sqrt{58}} = \dfrac{\sqrt{50}}{\sqrt{58}} = 0{,}92;\ C = \arccos 0{,}92 = \boxed{21{,}8^\circ}$

② a) $\vec{u}\cdot\vec{v} = |\vec{u}|\,\text{proy}\,\vec{u}|_{\vec{v}}\ ;\ \text{proy}\,\vec{u}|_{\vec{v}} = \dfrac{\vec{u}\cdot\vec{v}}{|\vec{v}|} = \boxed{\dfrac{5}{\sqrt{26}}}$

b) $\left.\begin{array}{l}\vec{x}\cdot\vec{u}=0\\ \vec{x}\cdot\vec{v}=1\end{array}\right\}\ \left.\begin{array}{l}3x_1+4x_2=0\\ 2x_1-3x_2=1\end{array}\right\}\ \left.\begin{array}{l}9x_1+12x_2=0\\ 8x_1-12x_2=4\end{array}\right\}$

$17x_1 = 4;\ x_1 = \dfrac{4}{17};\ x_2 = -\dfrac{3}{4}x_1 = -\dfrac{3}{\cancel{4}}\cdot\dfrac{\cancel{4}}{17} = -\dfrac{3}{17};$

$\boxed{\vec{x}\left(\dfrac{4}{17}, -\dfrac{3}{17}\right)}$

③ 

$84-51 = 32 = 2x;\ x = 16$

$\text{tg}\,A = \dfrac{60}{16} = 3{,}75;\ A = \text{arc tg}\,3{,}75 = \boxed{75^\circ}$

$90-75 = 15;\ B = 15+90 = \boxed{105^\circ}$

④ $4\,\text{sen}\,\dfrac{x}{2} + 2\cos x = 3;\ 4\sqrt{\dfrac{1-\cos x}{2}} + 2\cos x = 3;\ 16\,\dfrac{1-\cos x}{2} = 9+4\cos^2 x - 12\cos x$

$4\cos^2 x - 4\cos x = 1;\ \cos x = \dfrac{4\pm\sqrt{16-16}}{8}\ (\sqrt{16+16}) = \dfrac{1}{2};$

$\boxed{x = 60+360k} \rightarrow 4\cdot\frac{1}{2} + 2\,\frac{1}{2} = 3 \Rightarrow$ válida

$x = \cancel{300+360k} \rightarrow 4\left(-\frac{1}{2}\right)+2\,\frac{1}{2} \neq 3$

⑤ $\dfrac{\text{sen}\,4a+\text{sen}\,2a}{\cos 4a+\cos 2a} = \dfrac{\cancel{2}\,\text{sen}\,3a\,\cancel{\cos a}}{\cancel{2}\cos 3a\,\cancel{\cos a}} = \boxed{\text{tg}\,3a}$

Para simplificar hay que factorizar → productos

⑥ $\dfrac{2\,\text{sen}\,a - \text{sen}\,2a}{2\,\text{sen}\,a + \text{sen}\,2a} = \text{tg}^2\,\dfrac{a}{2};\ \dfrac{2\,\text{sen}\,a - 2\,\text{sen}\,a\cos a}{2\,\text{sen}\,a + 2\,\text{sen}\,a\cos a} = \dfrac{1-\cos a}{1+\cos a};\ \dfrac{\cancel{2\,\text{sen}\,a}\,(1-\cos a)}{\cancel{2\,\text{sen}\,a}\,(1+\cos a)} = \dfrac{1-\cos a}{1+\cos a}$

⑦ $\dfrac{\text{sen}(\pi+x)\cdot\cos\left(\frac{\pi}{2}-x\right) - \text{tg}\,\frac{3\pi}{4}}{-\text{sen}\left(\frac{\pi}{2}+x\right)\cos\left(\frac{3\pi}{2}-x\right)} = \dfrac{-\text{sen}\,x\cdot\text{sen}\,x - \text{tg}\,135}{-\cos x\,(-\text{sen}\,x)} = \dfrac{-\text{sen}^2 x+1}{\text{sen}\,x\cos x} = \dfrac{\cos^{\cancel{2}} x}{\text{sen}\,x\,\cancel{\cos x}} = \boxed{\text{cotg}\,x}$