1 $A = \frac{5}{2}$; $B = 0$; $C = \frac{1}{2}$; $D = -\frac{\sqrt{2}}{4} - \frac{\sqrt{3}}{2}$.

2 $A = -2\sin x$; $B = -\sin x$; $C = \tan x$.

3 **1°** $\cos\alpha = \frac{2\sqrt{2}}{3}$; $\tan\alpha = \frac{\sqrt{2}}{4}$.

2° $E = (\cos\alpha)(-\cos\alpha) = -\cos^2\alpha = -\frac{8}{9}$.

4 $\cos x = -\frac{1}{\sqrt{5}}$; $\sin x = -\frac{2}{\sqrt{5}}$.

5 **1°** $\sin\alpha = \frac{1}{2}$; $\cos\alpha = \frac{\sqrt{3}}{2}$; $\tan\alpha = \frac{\sqrt{3}}{3}$; $\alpha = \frac{\pi}{6}$.

2° $E = \tan\alpha \cdot \cos\left(\frac{\pi}{2} + \alpha\right) = -\frac{\sqrt{3}}{6}$.

6 **1°** $\sin x = \frac{\sqrt{3}}{2} = \sin\frac{\pi}{3}$, soit $x = \frac{\pi}{3} + 2k\pi$, $K \in \mathbb{Z}$ ou $x = \frac{2\pi}{3} + 2k'\pi$, $K' \in \mathbb{Z}$

2° $\tan x = \tan\left(\frac{-\pi}{4}\right)$, soit $x = \frac{-\pi}{4} + k\pi$, $K \in \mathbb{Z}$.

3° $\cos x = -\frac{1}{2} = \cos\frac{2\pi}{3}$ soit $x = \frac{2\pi}{3}\ [2\pi]$ ou $x = \frac{-2\pi}{3}\ [2\pi]$

4° $\sin x \cdot \cos x = 0$ donne $\sin x = 0$ soit $x = k\pi$, $K \in \mathbb{Z}$

ou $\cos x = 0$ soit $x = \frac{\pi}{2} + k'\pi$, $K' \in \mathbb{Z}$

5° $\left(\cos x - \frac{1}{2}\right)\left(\cos x + \frac{1}{2}\right) = 0$, $\cos x = \frac{1}{2} = \cos \frac{\pi}{3}$, soit $x = \frac{\pi}{3} + 2k\pi$, $K \in \mathbb{Z}$

ou $x = \frac{-\pi}{3} + 2k'\pi$, $K' \in \mathbb{Z}$

ou $\cos x = -\frac{1}{2} = \cos \frac{2\pi}{3}$, soit $x = \frac{2\pi}{3} + 2k\pi$, $K \in \mathbb{Z}$

ou $x = \frac{-2\pi}{3} + 2k'\pi$, $K' \in \mathbb{Z}$

6° $\tan^2 x = 3$ donne $\tan x = \sqrt{3}$ soit $x = \frac{\pi}{3} + k\pi$, $K \in \mathbb{Z}$

ou $\tan x = -\sqrt{3}$ soit $x = \frac{-\pi}{3} + k'\pi$, $K' \in \mathbb{Z}$

7° $\cos x(2 \sin x + 1) = 0$ donne $\cos x = 0$, soit $x = \frac{\pi}{2} + k\pi$, $K \in \mathbb{Z}$

ou $\sin x = -\frac{1}{2} = \sin\left(-\frac{\pi}{6}\right)$, soit $x = \frac{-\pi}{6}\ [2\pi]$

ou $x = \frac{7\pi}{6}\ [2\pi] = -\frac{5\pi}{6}\ [2\pi]$.

8° $\sin 2x = -\frac{\sqrt{3}}{2} = \sin\left(-\frac{\pi}{3}\right)$

$2x = \frac{-\pi}{3} + 2k\pi$, $K \in \mathbb{Z}$, soit $x = \frac{-\pi}{6} + \frac{2k\pi}{2}$, $K \in \mathbb{Z}$

$x_0 = \frac{-\pi}{6}\ [2\pi]$; $x_1 = \frac{-\pi}{6} + \pi\ [2\pi]$

ou $2x = \pi + \frac{\pi}{3} + 2k_1\pi$, soit $x = \frac{2\pi}{3} + \frac{2k_1\pi}{2}$

$x_0 = +\frac{2\pi}{3}\ [2\pi]$; $x_1 = \frac{2\pi}{3} + \pi\ [2\pi] = \frac{-\pi}{3}\ [2\pi]$

9° $\tan 2x = -\frac{\sqrt{3}}{2} = \tan\left(-\frac{\pi}{3}\right)$

$2x = \frac{-\pi}{3} + k\pi$, $K \in \mathbb{Z}$, soit $x = \frac{-\pi}{6} + \frac{2k\pi}{4}$

$x_0 = \frac{-\pi}{6}\ [2\pi]$; $x_1 = \frac{-\pi}{6} + \frac{\pi}{2}\ [2\pi]$; $x_2 = \frac{-\pi}{6} + \pi\ [2\pi]$;

$x_3 = \frac{-\pi}{6} + \frac{3\pi}{2}\ [2\pi] = \frac{-\pi}{2}\ [2\pi]$

10° $\sin\left(2x-\frac{\pi}{6}\right)=\sin\left(x+\frac{\pi}{3}\right)$ donne $2x-\frac{\pi}{6}=x+\frac{\pi}{3}+2k\pi$, soit

$x=\frac{\pi}{2}+2k\pi$, $K\in\mathbb{Z}$

ou $2x-\frac{\pi}{6}=\pi-x-\frac{\pi}{3}+2k_1\pi$, $K_1\in\mathbb{Z}$, soit $x=\frac{5\pi}{18}+\frac{2k_1\pi}{3}$

$x_0=\frac{5\pi}{18}\ [2\pi]$; $x_1=\frac{5\pi}{18}+\frac{2\pi}{3}\ [2\pi]$; $x_2=\frac{5\pi}{18}+\frac{4\pi}{3}\ [2\pi]=\frac{-7\pi}{18}\ [2\pi]$

11° $\sin 2x=\cos x=\sin\left(\frac{\pi}{2}-x\right)$, soit $x=\frac{\pi}{6}+\frac{2k\pi}{3}$ ou $x=\frac{\pi}{2}+2k\pi$.

12° $\cos\left(3x+\frac{\pi}{3}\right)=\cos 2x$ donne $3x+\frac{\pi}{3}=2x+2k\pi$, $K\in\mathbb{Z}$, soit

$x=\frac{-\pi}{3}+2k\pi$

ou $3x+\frac{\pi}{3}=-2x+2k_1\pi$, $K_1\in\mathbb{Z}$, soit $x=\frac{-\pi}{15}+\frac{2k_1\pi}{5}$

$x_0=\frac{-\pi}{15}\ [2\pi]$; $\begin{cases} x_1=\frac{-\pi}{15}+\frac{2\pi}{5}\ [2\pi] \\ x_1=\frac{\pi}{3}\ [2\pi] \end{cases}$; $\begin{cases} x_2=\frac{-\pi}{15}+\frac{4\pi}{5}\ [2\pi] \\ x_2=\frac{11\pi}{15}\ [2\pi] \end{cases}$;

$\begin{cases} x_3=\frac{-\pi}{15}+\frac{6\pi}{5}\ [2\pi] \\ x_3=\frac{-13\pi}{15}\ [2\pi] \end{cases}$; $\begin{cases} x_4=\frac{-\pi}{15}+\frac{8\pi}{5}\ [2\pi] \\ x_4=\frac{-7\pi}{15}\ [2\pi] \end{cases}$.

7 $\vec{u}=X\vec{i}+Y\vec{j}$ avec $X=\|\vec{u}\|\cdot\cos(\vec{i},\vec{u})=3\cos\left(-\frac{\pi}{6}\right)=3\cdot\frac{\sqrt{3}}{2}=\frac{3\sqrt{3}}{2}$ et

$Y=\|\vec{u}\|.\sin(\vec{i},\vec{u})=3\sin\left(-\frac{\pi}{6}\right)=3\left(\frac{-1}{2}\right)=\frac{-3}{2}$.

8 **1°** $E(\sqrt{3};1)$; $F\left(-\frac{3}{2};\frac{3\sqrt{3}}{2}\right)$

2° $EF=\sqrt{13}$.