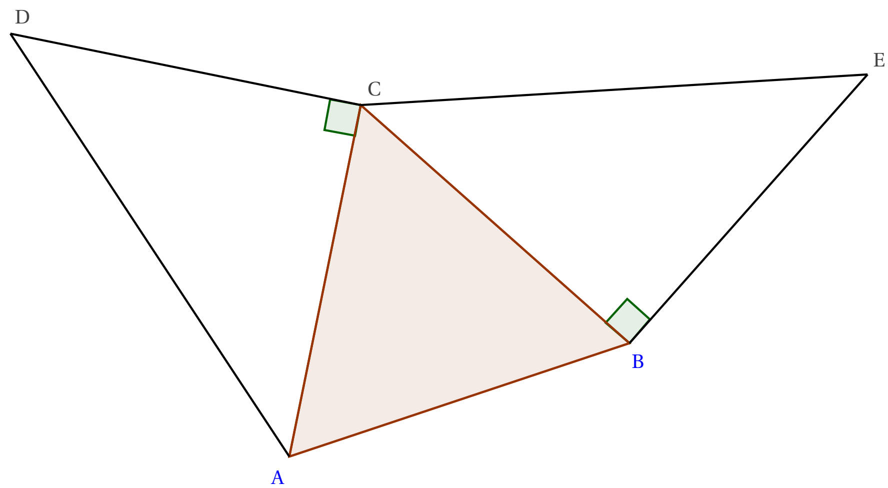
Devoir Surveillé 2 : Correction

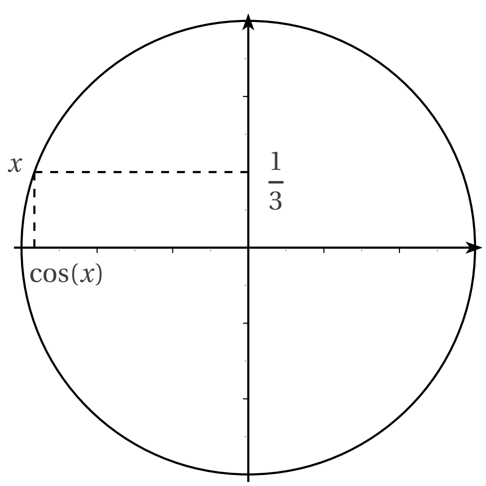
Exercice 1 : $(\overrightarrow{AC};\overrightarrow{AB}) = -(\overrightarrow{AB};\overrightarrow{AC}) = -\dfrac{\pi}{3} \quad [2\pi]$

$(\overrightarrow{BC};\overrightarrow{AB}) = (\overrightarrow{BC};\overrightarrow{BA}) + \pi = \dfrac{\pi}{3} + \pi = \dfrac{4\pi}{3} \equiv -\dfrac{2\pi}{3} \quad [2\pi]$

$(\overrightarrow{CD};\overrightarrow{CE}) = (\overrightarrow{CD};\overrightarrow{CA}) + (\overrightarrow{CA};\overrightarrow{CB}) + (\overrightarrow{CB};\overrightarrow{CE}) = \dfrac{\pi}{2} + \dfrac{\pi}{3} + \dfrac{\pi}{4} = \dfrac{13\pi}{12} \equiv -\dfrac{11\pi}{12} \quad [2\pi]$



Exercice 2 :

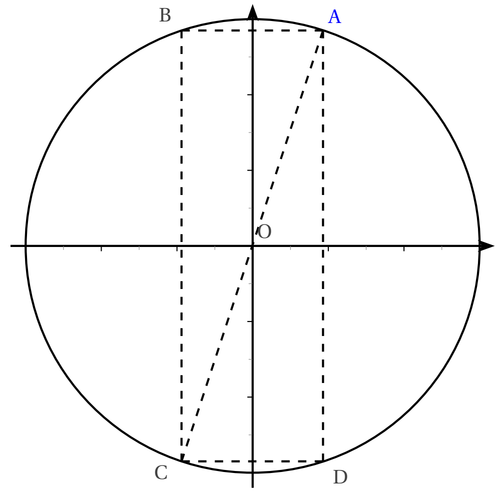
1. 

2. $\cos(x) \leq 0$ car $x \in \left[\dfrac{\pi}{2};\pi\right]$
3. On sait que

$$\cos^2(x) + \sin^2(x) = 1 \iff \cos^2(x) = 1 - \frac{1}{9} = \frac{8}{9}$$

De plus $\cos(x) < 0$ donc $\cos(x) = -\sqrt{\dfrac{8}{9}} = -\dfrac{2\sqrt{2}}{3}$.

4. On en déduit $x = \cos^{-1}\left(-\dfrac{2\sqrt{2}}{3}\right) \simeq 2.80$ rad.



Exercice 3 :

1. $x_A = \cos\left(\frac{2\pi}{5}\right) \simeq 0.31$ et $y_A = \sin\left(\frac{2\pi}{5}\right) \simeq 0.95$ et

2.

3.

4. • $[0;2\pi[$: $S = \left\{\frac{3\pi}{5}; \frac{7\pi}{5}\right\}$

• $]-\pi;\pi]$: $S = \left\{\frac{3\pi}{5}; -\frac{3\pi}{5}\right\}$

Exercice 4 : **(8 points)**

1. **a.** • $]-\pi;\pi]$: $S = \left\{\frac{\pi}{3}; \frac{2\pi}{3}\right\}$ • $[0;4\pi[$: $S = \left\{\frac{\pi}{3}; \frac{2\pi}{3}; \frac{7\pi}{3}; \frac{8\pi}{3}\right\}$ • $\mathbb{R}$: $S = \left\{\frac{\pi}{3} + 2k\pi; \frac{2\pi}{3} + 2k\pi, \text{ avec } k \in \mathbb{Z}\right\}$

b. $\frac{38\pi}{3} = \frac{36\pi}{3} + \frac{2\pi}{3} = 12\pi + \frac{2\pi}{3} \equiv \frac{2\pi}{3} \quad [2\pi]$

c. Ce nombre est solution de l'équation car de la forme $\frac{2\pi}{3} + 2 \times 6\pi$

d. $-\frac{62\pi}{6} = -\frac{31\pi}{3} = -\frac{30\pi}{3} - \frac{\pi}{3} = -10\pi - \frac{\pi}{3} \equiv -\frac{\pi}{3} \quad [2\pi]$ La mesure principale de ce nombre n'est pas solution de l'équation, donc lui non plus.

2. **a.** $S = \left\{-\frac{3\pi}{4}; \frac{3\pi}{4}\right\}$ **b.** $S \left]-\frac{3\pi}{4}; \frac{3\pi}{4}\right[$