

Exprimer à l'aide de $\cos x$ et $\sin x$:

a) $\sin\left(\frac{7\pi}{2} - x\right)$ b) $\cos(-13\pi - x)$ c) $\sin\left(-\frac{3\pi}{2} + x\right)$.

On sait que :

$$\cos(a + 2k\pi) = \cos a, \quad \sin(a + 2k\pi) = \sin a, \quad \cos(-a) = \cos a, \quad \sin(-a) = -\sin a :$$

$$\sin\left(\frac{\pi}{2} + a\right) = \cos a, \quad \cos(\pi - a) = -\cos a .$$

$$\text{a) } \frac{7\pi}{2} = \frac{8\pi - \pi}{2} = 4\pi - \frac{\pi}{2} = 2 \text{ tours} - \frac{\pi}{2} \Rightarrow \sin\left(\frac{7\pi}{2} - x\right) = \sin\left(-\frac{\pi}{2} - x\right) = -\sin\left(\frac{\pi}{2} + x\right) = -\cos x .$$

$$\text{b) } -13\pi = -14\pi + \pi = -7 \text{ tours} + \pi \Rightarrow \cos(-13\pi - x) = \cos(\pi - x) = -\cos x .$$

$$\text{c) } -\frac{3\pi}{2} = \frac{-4\pi + \pi}{2} = -2\pi + \frac{\pi}{2} = -1 \text{ tour} + \frac{\pi}{2} \Rightarrow \sin\left(-\frac{3\pi}{2} + x\right) = \sin\left(\frac{\pi}{2} + x\right) = \cos x .$$