

Correction de l'exercice 23 p. 249.

a.

$$\begin{aligned}\sqrt{2} \cos \left(x + \frac{\pi}{4} \right) &= \sqrt{2} \left(\cos x \cos \frac{\pi}{4} - \sin x \sin \frac{\pi}{4} \right) \\ &= \sqrt{2} \left(\frac{\sqrt{2}}{2} \cos x - \frac{\sqrt{2}}{2} \sin x \right) \\ &= \frac{\sqrt{2} \times \sqrt{2}}{2} \cos x - \frac{\sqrt{2} \times \sqrt{2}}{2} \sin x \\ &= \frac{2}{2} \cos x - \frac{2}{2} \sin x \\ &= \cos x - \sin x\end{aligned}$$

b.

$$\begin{aligned}\sqrt{2} \sin \left(x - \frac{\pi}{4} \right) &= \sqrt{2} \left(\sin x \cos \frac{\pi}{4} - \cos x \sin \frac{\pi}{4} \right) \\ &= \sqrt{2} \left(\frac{\sqrt{2}}{2} \sin x - \frac{\sqrt{2}}{2} \cos x \right) \\ &= \frac{\sqrt{2} \times \sqrt{2}}{2} \sin x - \frac{\sqrt{2} \times \sqrt{2}}{2} \cos x \\ &= \frac{2}{2} \sin x - \frac{2}{2} \cos x \\ &= \sin x - \cos x\end{aligned}$$

c.

$$\begin{aligned}2 \cos \left(x - \frac{\pi}{3} \right) &= 2 \left(\cos x \cos \frac{\pi}{3} + \sin x \sin \frac{\pi}{3} \right) \\ &= 2 \left(\frac{1}{2} \cos x + \frac{\sqrt{3}}{2} \sin x \right) \\ &= \frac{2 \times 1}{2} \cos x + \frac{2 \times \sqrt{3}}{2} \sin x \\ &= \cos x + \sqrt{3} \sin x\end{aligned}$$