

# Exercice 1

$$\cos\left(\frac{5\pi}{4}\right) = \cos\left(\frac{3\pi}{2} - \frac{\pi}{4}\right) = -\sin\left(\frac{\pi}{4}\right) = -\frac{1}{\sqrt{2}}$$

$$\sin\left(\frac{5\pi}{4}\right) = \sin\left(\frac{3\pi}{2} - \frac{\pi}{4}\right) = -\cos\left(\frac{\pi}{4}\right) = -\frac{1}{\sqrt{2}}$$

# Exercice 2

$$\frac{3}{8} - \frac{1}{2} \cos 2x + \frac{1}{8} \cos 4x = \frac{3}{8} - \frac{1}{2} (\cos^2 x - \sin^2 x) + \frac{1}{8} (\cos^2 2x - \sin^2 2x)$$

$$= \frac{3}{8} - \frac{1}{2} (1 - 2\sin^2 x) + \frac{1}{8} ((\cos^2 x - \sin^2 x)^2 - (2\sin x \cos x)^2)$$

$$= \frac{3}{8} - \frac{1}{2} + \sin^2 x + \frac{1}{8} ((1 - 2\sin^2 x)^2 - 4\sin^2 x \cos^2 x)$$

$$= \frac{3}{8} - \frac{1}{2} + \sin^2 x + \frac{1}{8} (1 + 4\sin^4 x - 4\sin^2 x - 4\sin^2 x + 4\sin^4 x)$$

$$= \frac{3}{8} - \frac{1}{2} + \sin^2 x + \frac{1}{8} (1 + 8\sin^4 x - 8\sin^2 x)$$

$$= \frac{3}{8} - \frac{1}{2} + \sin^2 x + \frac{1}{8} + \sin^4 x - \sin^2 x$$

$$= \sin^4 x.$$

qfd