

Toutes ces formules sont valables pour tous réels  $x$ ,  $a$ ,  $b$ ,  $\alpha$  et pour tout entier relatif  $k$ .

## 1 Propriétés, périodicité et parité

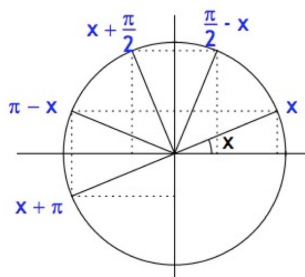
$$\begin{aligned} -1 \leq \cos x \leq 1 & \quad ; & \quad -1 \leq \sin x \leq 1 & \quad ; & \quad \cos^2 x + \sin^2 x = 1 \\ \sin(x + k \times 2\pi) = \sin x & \quad ; & \quad \cos(x + k \times 2\pi) = \cos x \\ \sin(-x) = -\sin x & \quad ; & \quad \cos(-x) = \cos x \end{aligned}$$

## 2 Dérivées

$$\sin' x = \cos x \quad ; \quad \cos' x = -\sin x$$

## 3 Formules de correspondances

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



## 4 Formules d'addition

$$\begin{aligned} \cos(a - b) &= \cos a \cos b + \sin a \sin b & ; & \quad \sin(a + b) = \sin a \cos b + \cos a \sin b \\ \cos(a + b) &= \cos a \cos b - \sin a \sin b & ; & \quad \sin(a - b) = \sin a \cos b - \cos a \sin b \end{aligned}$$

## 5 Formules de duplication

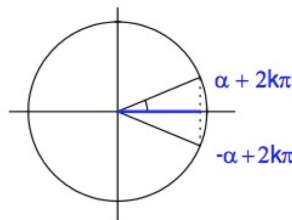
$$\cos 2x = \cos^2 x - \sin^2 x = 2 \cos^2 x - 1 = 1 - 2 \sin^2 x \quad ; \quad \sin 2x = 2 \sin x \cos x$$

## 6 Formules de linéarisation

$$\cos^2 x = \frac{1 + \cos 2x}{2} \quad ; \quad \sin^2 x = \frac{1 - \cos 2x}{2}$$

## 7 Résolution d'équations

$$\cos x = \cos \alpha \Leftrightarrow \begin{cases} x = \alpha + k \times 2\pi, k \in \mathbb{Z} \\ \text{ou} \\ x = -\alpha + k' \times 2\pi, k' \in \mathbb{Z} \end{cases}$$



$$\sin x = \sin \alpha \Leftrightarrow \begin{cases} x = \alpha + k \times 2\pi, k \in \mathbb{Z} \\ \text{ou} \\ x = \pi - \alpha + k' \times 2\pi, k' \in \mathbb{Z} \end{cases}$$

