

FORMULAIRE DE TRIGONOMÉTRIE

Cosinus

$$\mathbf{R} \xrightarrow{\cos} [-1, 1]$$

$$[0, \pi] \xleftarrow{\arccos} [-1, 1]$$

$$-1 \leq \cos \theta \leq 1$$

cos est 2π -périodique :

$$\cos(\theta + 2\pi) = \cos \theta$$

$$\forall k \in \mathbf{Z}, \cos(\theta + 2k\pi) = \cos \theta$$

cos est *pair* : $\cos(-\theta) = \cos \theta$

$$\cos(a + b) = \cos a \cos b - \sin a \sin b$$

$$\cos(a - b) = \cos a \cos b + \sin a \sin b$$

$$\cos(2a) = 2 \cos^2 a - 1$$

$$= 1 - 2 \sin^2 a$$

$$\cos(\pi - \theta) = -\cos \theta$$

$$\cos(\pi + \theta) = -\cos \theta$$

$$\cos\left(\frac{\pi}{2} - \theta\right) = \sin \theta$$

$$\cos\left(\frac{\pi}{2} + \theta\right) = -\sin \theta$$

$$\sin(\pi - \theta) = \sin \theta$$

$$\sin(\pi + \theta) = -\sin \theta$$

$$\sin\left(\frac{\pi}{2} - \theta\right) = \cos \theta$$

$$\sin\left(\frac{\pi}{2} + \theta\right) = \cos \theta$$

Sinus

$$\mathbf{R} \xrightarrow{\sin} [-1, 1]$$

$$\left[-\frac{\pi}{2}, \frac{\pi}{2}\right] \xleftarrow{\arcsin} [-1, 1]$$

$$-1 \leq \sin \theta \leq 1$$

sin est 2π -périodique :

$$\sin(\theta + 2\pi) = \sin \theta$$

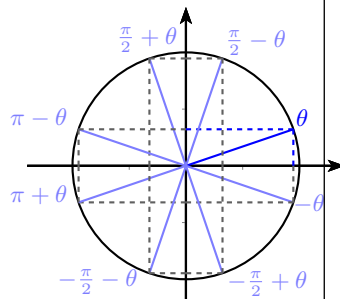
$$\forall k \in \mathbf{Z}, \sin(\theta + 2k\pi) = \sin \theta$$

sin est *impair* : $\sin(-\theta) = -\sin \theta$

$$\sin(a + b) = \sin a \cos b + \cos a \sin b$$

$$\sin(a - b) = \sin a \cos b - \cos a \sin b$$

$$\sin(2a) = 2 \sin a \cos a$$



Tangente

$$\mathbf{R} \setminus \left\{ \frac{\pi}{2} + k\pi, k \in \mathbf{Z} \right\} \xrightarrow{\tan} \mathbf{R}$$

$$\left] -\frac{\pi}{2}, \frac{\pi}{2} \right[\xleftarrow{\arctan} \mathbf{R}$$

tan est π périodique :

$$\tan(\theta + \pi) = \tan \theta$$

$$\forall k \in \mathbf{Z}, \tan(\theta + k\pi) = \tan \theta$$

tan est *impair* : $\tan(-\theta) = -\tan \theta$

$$\tan(\theta - \pi) = -\tan \theta$$

$$\tan(\theta + \pi) = \tan \theta$$

Angles remarquables :

θ	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$
$\cos \theta$	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0
$\sin \theta$	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1
$\tan \theta$	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	\times

Pythagore :

$$\forall \theta \in \mathbf{R}, \cos^2 \theta + \sin^2 \theta = 1$$

Formules de linéarisation :

$$\cos a \cos b = \frac{1}{2} (\cos(a + b) + \cos(a - b))$$

$$\sin a \sin b = \frac{1}{2} (\cos(a - b) - \cos(a + b)) \quad \sin a \cos b = \frac{1}{2} (\sin(a + b) + \sin(a - b))$$

