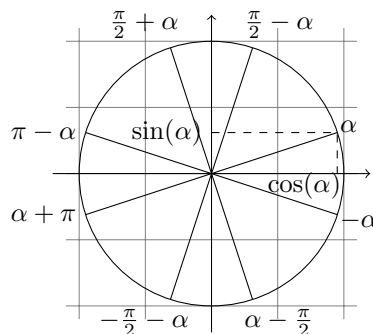


Formulaire de Trigonométrie

Angles remarquables :

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



Angles associés :

$\cos(-\alpha) = \cos(\alpha)$	$\sin(-\alpha) = -\sin(\alpha)$	$\tan(-\alpha) = -\tan(\alpha)$
$\cos(\pi - \alpha) = -\cos(\alpha)$	$\sin(\pi - \alpha) = \sin(\alpha)$	$\tan(\pi - \alpha) = -\tan(\alpha)$
$\cos(\pi + \alpha) = -\cos(\alpha)$	$\sin(\pi + \alpha) = -\sin(\alpha)$	$\tan(\pi + \alpha) = \tan(\alpha)$
$\cos(\frac{\pi}{2} - \alpha) = \sin(\alpha)$	$\sin(\frac{\pi}{2} - \alpha) = \cos(\alpha)$	$\tan(\frac{\pi}{2} - \alpha) = \frac{1}{\tan(\alpha)}$

Formules fondamentales :

$$\cos^2(x) + \sin^2(x) = 1 \quad 1 + \tan^2(x) = \frac{1}{\cos^2(x)}$$

Équations trigonométriques de base :

$\sin(x) = \sin(a) \iff \begin{cases} x = a[2\pi] \\ \text{ou} \\ x = \pi - a[2\pi] \end{cases}$	$\cos(x) = \cos(a) \iff \begin{cases} x = a[2\pi] \\ \text{ou} \\ x = -a[2\pi] \end{cases}$
$\tan(x) = \tan(a) \iff x = a[\pi]$	

Formules d'addition :

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

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

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

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

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

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

Formules de duplication :

$$\begin{aligned} \cos(2a) &= \cos^2(a) - \sin^2(a) \\ &= 2\cos^2(a) - 1 \\ &= 1 - 2\sin^2(a) \end{aligned}$$

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

$$\tan(2a) = \frac{2\tan(a)}{1 - \tan^2(a)}$$

Formules de multiplication :

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

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

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

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

$$\sin^2(a) = \frac{1}{2}(1 - \cos(2a))$$

Formules de la tangente du demi-angle : (on pose $t = \tan(\frac{x}{2})$)

$$\cos(x) = \frac{1 - t^2}{1 + t^2}$$

$$\sin(x) = \frac{2t}{1 + t^2}$$

$$\tan(x) = \frac{2t}{1 - t^2}$$

Formules de Simpson :

$$\sin(p) + \sin(q) = 2\sin\left(\frac{p+q}{2}\right)\cos\left(\frac{p-q}{2}\right)$$

$$\sin(p) - \sin(q) = 2\cos\left(\frac{p+q}{2}\right)\sin\left(\frac{p-q}{2}\right)$$

$$\cos(p) + \cos(q) = 2\cos\left(\frac{p+q}{2}\right)\cos\left(\frac{p-q}{2}\right)$$

$$\cos(p) - \cos(q) = -2\sin\left(\frac{p+q}{2}\right)\sin\left(\frac{p-q}{2}\right)$$