

# FORMULAIRE DE TRIGONOMETRIE

## I. Relations de base

$$\cos^2 \theta + \sin^2 \theta = 1$$

$$\begin{aligned} \cos(-\theta) &= \cos \theta \\ \cos(\pi - \theta) &= -\cos \theta \\ \cos(\pi + \theta) &= -\cos \theta \end{aligned}$$

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

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

$$\begin{aligned} \sin(-\theta) &= -\sin \theta \\ \sin(\pi - \theta) &= \sin \theta \\ \sin(\pi + \theta) &= -\sin \theta \end{aligned}$$

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

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

$$\begin{aligned} \tan(-\theta) &= -\tan \theta \\ \cotan(-\theta) &= -\cotan \theta \end{aligned}$$

## II. Formules en t

$$t = \tan \frac{\theta}{2}$$

$$1 + t^2 = \frac{1}{\cos^2 \frac{\theta}{2}}$$

$$\cos \theta = \frac{1 - t^2}{1 + t^2}$$

$$\sin \theta = \frac{2t}{1 + t^2}$$

$$\tan \theta = \frac{2t}{1 - t^2}$$

## III. Formules d'addition

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

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

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

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

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

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

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

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

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

$$\sin 2a = 2 \sin a \cos a$$

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

## IV. Arcs remarquables

$\theta$ (°)	0	30	45	60	90
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$\theta$ (rad)	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$
$\sin \theta$	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1
$\cos \theta$	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0
$\tan \theta$	0	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	$\infty$

## V. Formules de transformation de produit en somme

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

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

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

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

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