

Formulaire de trigonométrie

Formules de base – ♥♥

$$\cos^2(x) + \sin^2(x) = 1 \quad \begin{cases} \cos(-x) = \cos x \\ \sin(-x) = -\sin x \end{cases}$$

Formules avec π – ♥ A retrouver sur le cercle

$$\begin{array}{ll} \cos(\pi - x) = -\cos x & \cos(\frac{\pi}{2} - x) = \sin x \\ \sin(\pi - x) = \sin x & \sin(\frac{\pi}{2} - x) = \cos x \\ \cos(\pi + x) = -\cos x & \cos(\frac{\pi}{2} + x) = -\sin x \\ \sin(\pi + x) = -\sin x & \sin(\frac{\pi}{2} + x) = \cos x \end{array}$$

Formules d'addition – ♥♥

$$\begin{array}{l} \cos(a + b) = \cos a \cos b - \sin a \sin b \\ \cos(a - b) = \cos a \cos b + \sin a \sin b \\ \sin(a + b) = \sin a \cos b + \cos a \sin b \\ \sin(a - b) = \sin a \cos b - \cos a \sin b \\ \sin(2a) = 2 \sin a \cos a \\ \cos(2a) = \cos^2 a - \sin^2 a = 2 \cos^2 a - 1 = 1 - 2 \sin^2 a \end{array}$$

Transformations de sommes en produits – ♥♥ En posant : « $p = a + b$ et $q = a - b$ » i.e. $a = \frac{p+q}{2}$ et $b = \frac{p-q}{2}$

$$\begin{array}{l} \cos p + \cos q = 2 \cos \frac{p+q}{2} \cos \frac{p-q}{2} \\ \cos p - \cos q = -2 \sin \frac{p+q}{2} \sin \frac{p-q}{2} \end{array}$$

Formules avec $\tan$ – ♥♥

$$\begin{array}{l} \tan(a + b) = \frac{\tan a + \tan b}{1 - \tan a \tan b} \\ \tan(a - b) = \frac{\tan a - \tan b}{1 + \tan a \tan b} \end{array} \quad \tan(2a) = \frac{2 \tan a}{1 - \tan^2 a}$$

Valeurs remarquables – ♥♥

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

Produits en sommes, linéarisation – ♥

$$\begin{array}{l} \cos a \cos b = \frac{1}{2} (\cos(a + b) + \cos(a - b)) \\ \sin a \sin b = \frac{1}{2} (\cos(a - b) - \cos(a + b)) \\ \sin a \cos b = \frac{1}{2} (\sin(a + b) + \sin(a - b)) \\ \cos^2(a) = \frac{1 + \cos(2a)}{2} \quad \sin^2(a) = \frac{1 - \cos(2a)}{2} \end{array}$$

$$\begin{array}{l} \sin p + \sin q = 2 \sin \frac{p+q}{2} \cos \frac{p-q}{2} \\ \sin p - \sin q = 2 \cos \frac{p+q}{2} \sin \frac{p-q}{2} \end{array}$$

Formules avec $\tan \frac{a}{2}$ – ♥♥

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