

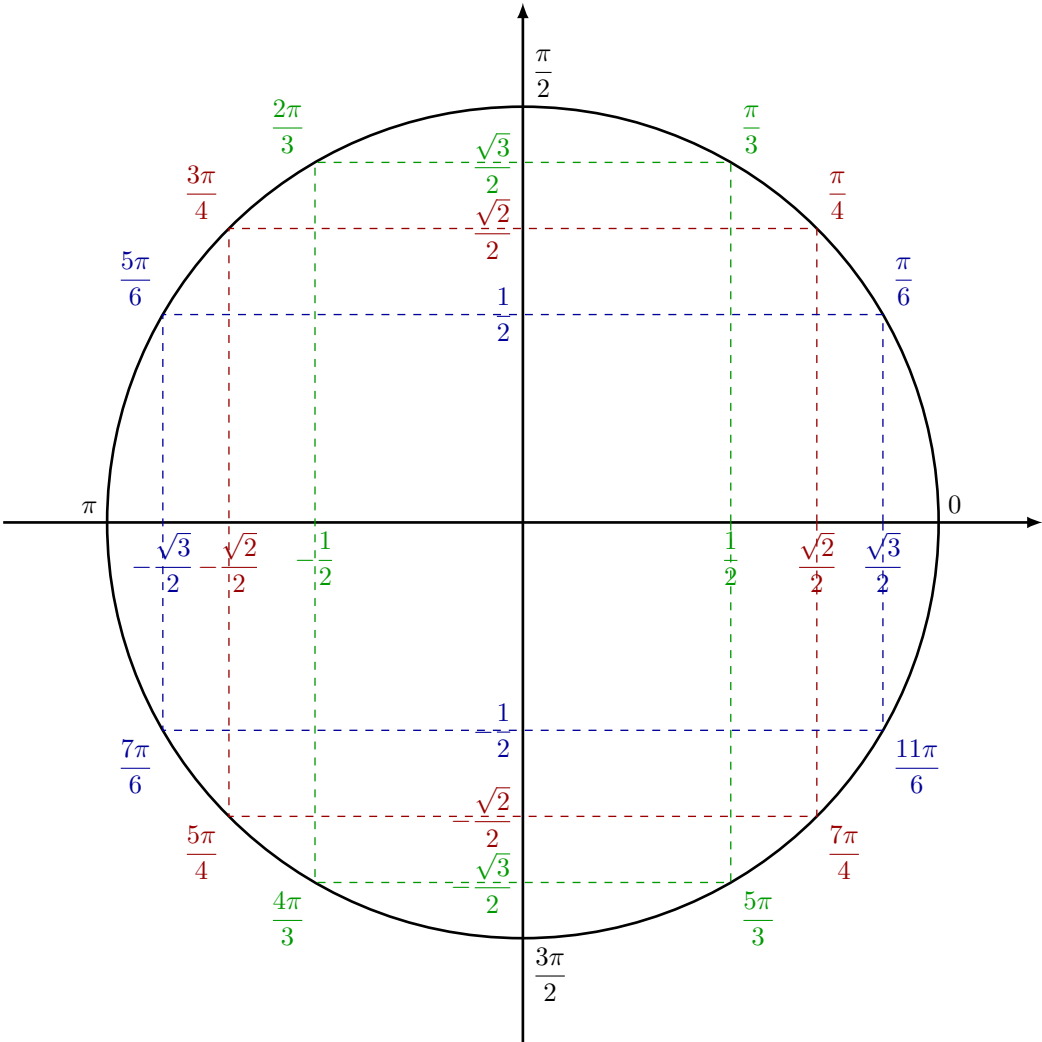
Formulaire trigonométrie

Le radian

Angle en degré	0°	30°	45°	60°	90°	180°	360°
Angle en radian	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	π	2π

Valeurs remarquables

x	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	π
cos(x)	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0	-1
sin(x)	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1	0
tan(x)	0	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	Non défini	0



Relations élémentaires

• $\cos(-x) = \cos(x)$	• $\sin(-x) = -\sin(x)$	• $\tan(-x) = -\tan(x)$
• $\cos(\pi - x) = -\cos(x)$	• $\sin(\pi - x) = \sin(x)$	• $\tan(\pi - x) = -\tan(x)$
• $\cos(\pi + x) = -\cos(x)$	• $\sin(\pi + x) = -\sin(x)$	• $\tan(\pi + x) = \tan(x)$
• $\cos\left(\frac{\pi}{2} - x\right) = \sin(x)$	• $\sin\left(\frac{\pi}{2} - x\right) = \cos(x)$	• $\tan\left(\frac{\pi}{2} - x\right) = \frac{1}{\tan(x)}$
• $\cos\left(\frac{\pi}{2} + x\right) = -\sin(x)$	• $\sin\left(\frac{\pi}{2} + x\right) = \cos(x)$	• $\tan\left(\frac{\pi}{2} + x\right) = -\frac{1}{\tan(x)}$

Equations trigonométriques

$\cos(x) = \cos(a) \iff \begin{cases} x = a + 2k\pi \\ x = -a + 2k\pi \end{cases}$	$\sin(x) = \sin(a) \iff \begin{cases} x = a + 2k\pi \\ x = \pi - a + 2k\pi \end{cases}$
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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

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

Formules de linéarisation

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

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

Formules diverses

Si $t = \tan\left(\frac{x}{2}\right)$ on a :

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