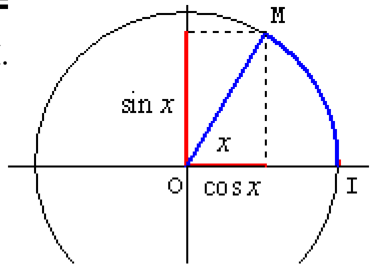
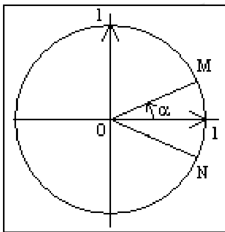
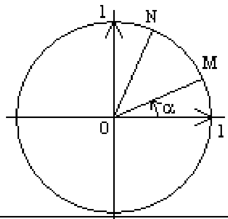
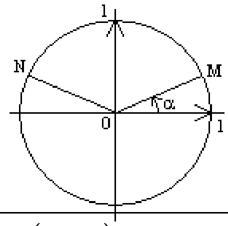
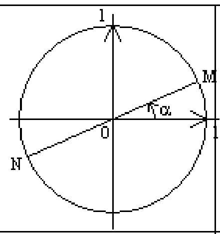
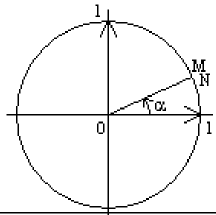
FORMULAIRE DE TRIGONOMETRIE



x étant une mesure de l'angle $(\overrightarrow{OI};\overrightarrow{OM})$, cos x est l'abscisse de M, sin x est l'ordonnée de M.

$\begin{cases}\cos 0 = 1\\ \sin 0 = 0\end{cases}$ $\begin{cases}\cos\frac{\pi}{6} = \frac{\sqrt{3}}{2}\\ \sin\frac{\pi}{6} = \frac{1}{2}\end{cases}$ $\begin{cases}\cos\frac{\pi}{4} = \frac{\sqrt{2}}{2}\\ \sin\frac{\pi}{4} = \frac{\sqrt{2}}{2}\end{cases}$ $\begin{cases}\cos\frac{\pi}{3} = \frac{1}{2}\\ \sin\frac{\pi}{3} = \frac{\sqrt{3}}{2}\end{cases}$ $\begin{cases}\cos\frac{\pi}{2} = 0\\ \sin\frac{\pi}{2} = 1\end{cases}$

Pour tout réel α, $\boxed{\cos^2\alpha + \sin^2\alpha = 1}$

				
$\begin{cases}\cos(-\alpha) = \cos\alpha\\ \sin(-\alpha) = -\sin\alpha\end{cases}$	$\begin{cases}\cos\left(\frac{\pi}{2}-\alpha\right) = \sin\alpha\\ \sin\left(\frac{\pi}{2}-\alpha\right) = \cos\alpha\end{cases}$ α et $\frac{\pi}{2}-\alpha$ sont complémentaires. leur somme vaut $\frac{\pi}{2}$	$\begin{cases}\cos(\pi-\alpha) = -\cos\alpha\\ \sin(\pi-\alpha) = \sin\alpha\end{cases}$ α et $\pi-\alpha$ sont supplémentaires leur somme vaut π	$\begin{cases}\cos(\alpha+\pi) = -\cos\alpha\\ \sin(\alpha+\pi) = -\sin\alpha\end{cases}$	$\begin{cases}\cos(\alpha+2\pi) = \cos\alpha\\ \sin(\alpha+2\pi) = \sin\alpha\end{cases}$

Formules de transformation et de dupplication :

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

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

$\cos(2a) = \begin{cases}\cos^2 a - \sin^2 a\\ 2\cos^2 a - 1\\ 1 - 2\sin^2 a\end{cases}$ $\sin(2a) = 2\cdot\sin a\cdot\cos a$ $\tan(2a) = \frac{2\cdot\tan a}{1-\tan^2 a}$

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

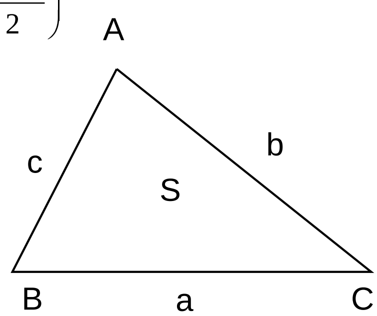
Transformation de produit en somme

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

Transformation de somme en produit

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

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



Formules utilisant des tangentes :

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

Posons $t = \tan\frac{x}{2}$, alors $\cos x = \frac{1-t^2}{1+t^2}$, $\sin x = \frac{2t}{1+t^2}$ et $\tan x = \frac{2t}{1-t^2}$

Relations métriques dans le triangle.

Formule d'Al-Kashi	$a^2 = b^2 + c^2 - 2bc\cos(\widehat{A})$, $b^2 = a^2 + c^2 - 2ac\cos(\widehat{B})$ et $c^2 = a^2 + b^2 - 2ab\cos(\widehat{C})$
Aire du triangle	$S = \frac{1}{2}ab\sin\widehat{C} = \frac{1}{2}bc\sin\widehat{a} = \frac{1}{2}ac\sin\widehat{B}$. Enfin $\boxed{\frac{a}{\sin\widehat{A}} = \frac{b}{\sin\widehat{B}} = \frac{c}{\sin\widehat{C}}}$ (formule des 3 sinus)