

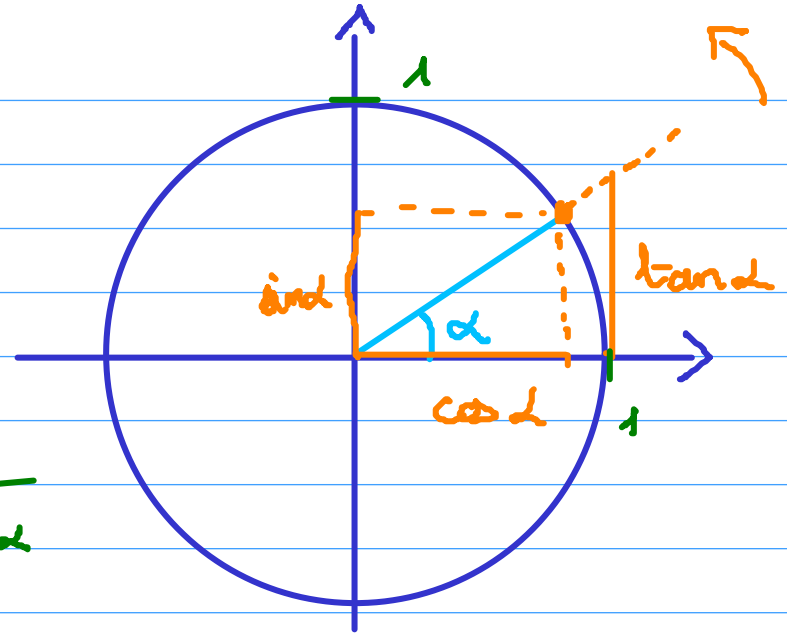
Trigonometrie

Cercle trigonométrique

Relations fondamentales

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

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

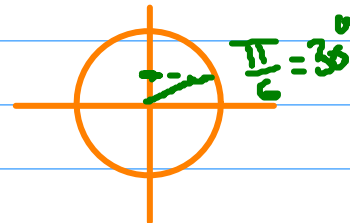


Valeurs remarquables

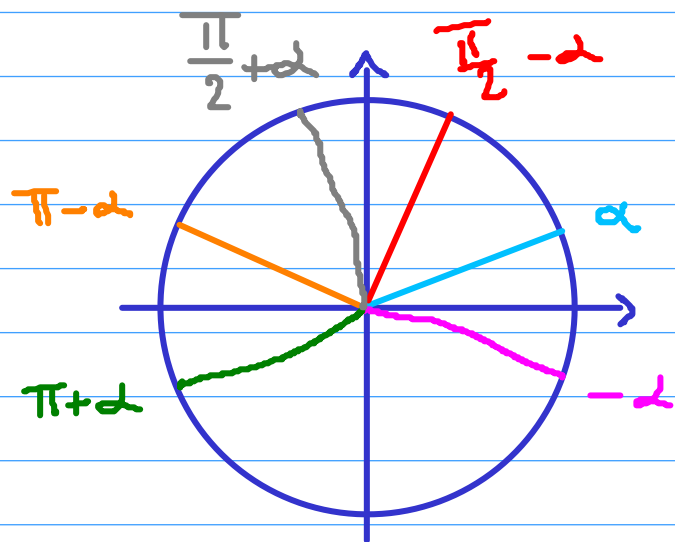
	0	$\frac{\pi}{6}^{30^\circ}$	$\frac{\pi}{4}^{45^\circ}$	$\frac{\pi}{3}^{60^\circ}$	$\frac{\pi}{2}^{90^\circ}$
cos	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0
sin	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1
tan	0	$\frac{1}{\sqrt{3}}$ $= \frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	/

$$\frac{\sqrt{2}}{2} \approx 0,707$$

$$\frac{\sqrt{3}}{2} \approx 0,866$$



Angles associés



$$\cos(-\alpha) = \cos \alpha$$

$$\sin(-\alpha) = -\sin \alpha$$

$$\tan(-\alpha) = -\tan \alpha$$

$$\cos(\pi + \alpha) = -\cos \alpha$$

$$\sin(\pi + \alpha) = -\sin \alpha$$

$$\tan(\pi + \alpha) = \tan \alpha$$

$$\cos(\pi - \alpha) = -\cos \alpha$$

$$\sin(\pi - \alpha) = \sin \alpha$$

$$\tan(\pi - \alpha) = -\tan \alpha$$

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

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

$$\tan\left(\frac{\pi}{2} - \alpha\right) = \frac{1}{\tan \alpha}$$

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

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

$$\tan\left(\frac{\pi}{2} + \alpha\right) = -\frac{1}{\tan \alpha}$$

Complexes et trigonométrie

$$e^{ia} = \cos a + i \sin a$$

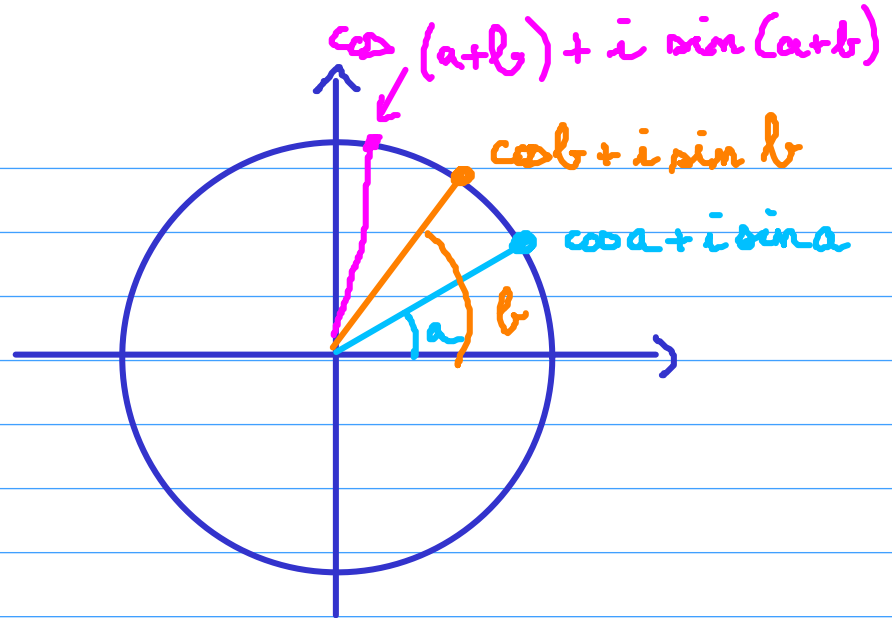
$$e^{ib} = \cos b + i \sin b$$

$$e^{i(a+b)} = \underline{\cos(a+b)} + i \underline{\sin(a+b)}$$

$$= e^{ia} \times e^{ib}$$

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

$$= (\underline{\cos a \cos b - \sin a \sin b}) + i (\underline{\cos a \sin b + \sin a \cos b})$$



$$\cos(75^\circ) = \cos(45^\circ + 30^\circ)$$

Formules d'addition

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

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

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

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

$$\begin{aligned}\cos(-b) &= \cos b \\ \sin(-b) &= -\sin b\end{aligned}$$

Formules de duplication

$$\begin{aligned}\cos(2a) &= \cos(a+a) = \cos a \cos a - \sin a \sin a = \cos^2 a - \sin^2 a \\ &\quad \left(\begin{array}{l} \cos^2 a = 1 - \sin^2 a \\ \sin^2 a = 1 - \cos^2 a \end{array} \right) \begin{aligned} &= 1 - 2\sin^2 a \\ &= 2\cos^2 a - 1 \end{aligned}\end{aligned}$$

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

À vous de jouer !

① Formules d'addition et de duplication pour la tangente ?

$$\tan(a+b) = ?$$

$$\tan(2a) = ?$$

$$\frac{\tan a}{\tan b}$$

② Calculer $\cos\left(\frac{\pi}{8}\right)$

③ Soit $x \in \mathbb{R}$, exprimer $\cos(3x)$ en fonction de $\cos x$