Trigonométrie

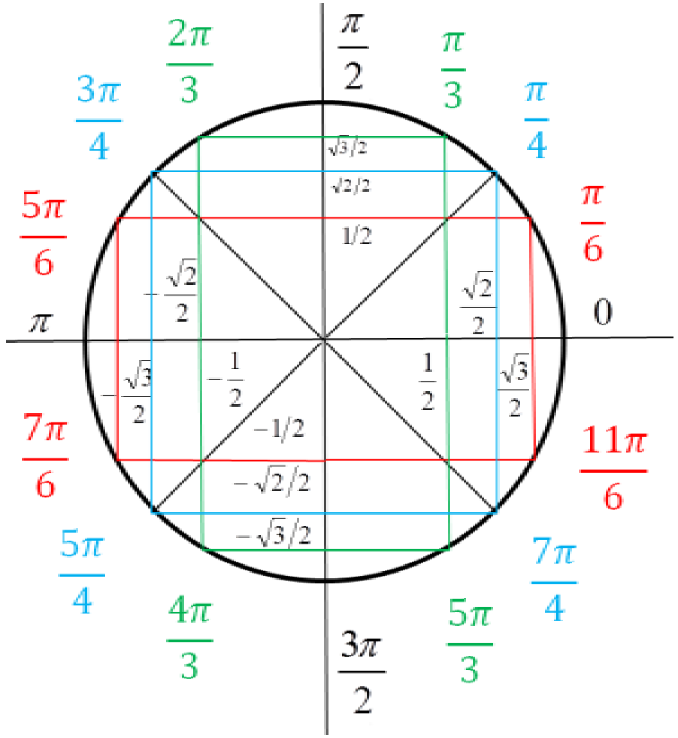
Formules d'addition :

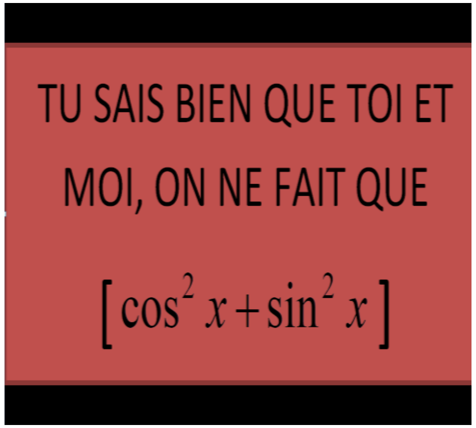
$$\cos(a+b)=\cos(a)\cos(b)-\sin(a)\sin(b)$$
$$\cos(a-b)=\cos(a)\cos(b)+\sin(a)\sin(b)$$

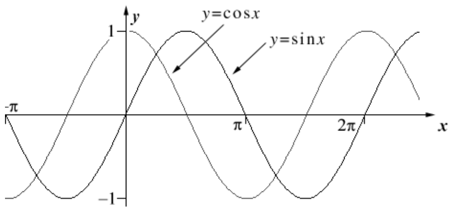
$$\sin(a+b)=\sin(a)\cos(b)+\sin(b)\cos(a)$$
$$\sin(a-b)=\sin(a)\cos(b)-\sin(b)\cos(a)$$

Formules de duplication :

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







Somme de sinusoides :

$$A\cos x+B\sin x=C\cos(x-\varphi)\ avec\ C=\sqrt{A^2+B^2}$$
$$\cos(\varphi)=\frac{A}{C}\ et\ \sin(\varphi)=\frac{B}{C}$$

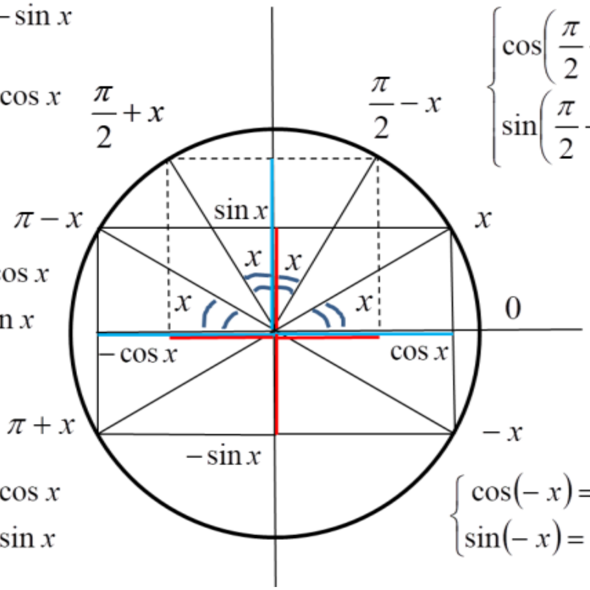
$C\cos(x-\varphi)$ est un cosinus amplifié de C et décalé de φ vers la droite

Conséquence des formules d'addition :

$$\begin{cases}\cos(a+b)+\cos(a-b)=2\cos a\cos b\\ \cos p+\cos q=2\cos\left(\frac{p+q}{2}\right)\cos\left(\frac{p-q}{2}\right)\end{cases} \qquad \begin{cases}\sin(a+b)+\sin(a-b)=2\sin a\cos b\\ \sin p+\sin q=2\sin\left(\frac{p+q}{2}\right)\cos\left(\frac{p-q}{2}\right)\end{cases}$$

$$\begin{cases}\cos(a+b)-\cos(a-b)=-2\sin a\sin b\\ \cos p-\cos q=-2\sin\left(\frac{p+q}{2}\right)\sin\left(\frac{p-q}{2}\right)\end{cases} \qquad \begin{cases}\sin(a+b)-\sin(a-b)=2\sin b\cos a\\ \sin p-\sin q=2\sin\left(\frac{p-q}{2}\right)\cos\left(\frac{p+q}{2}\right)\end{cases}$$

$$\begin{cases}\cos\left(\frac{\pi}{2}+x\right)=-\sin x\\ \sin\left(\frac{\pi}{2}+x\right)=\cos x\end{cases} \qquad \begin{cases}\cos\left(\frac{\pi}{2}-x\right)=\sin x\\ \sin\left(\frac{\pi}{2}-x\right)=\cos x\end{cases}$$



$$\begin{cases}\cos(\pi-x)=-\cos x\\ \sin(\pi-x)=\sin x\end{cases}$$

$$\begin{cases}\cos(\pi+x)=-\cos x\\ \sin(\pi+x)=-\sin x\end{cases} \qquad \begin{cases}\cos(-x)=\cos x\\ \sin(-x)=-\sin x\end{cases}$$

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