Formulaire de trigonométrie

Cosinus

$$\mathbf{R} \xrightarrow{\cos} [-1,1]$$
$$[0,\pi] \xleftarrow[\text{arccos}]{} [-1,1]$$

$$-1 \leqslant \cos\theta \leqslant 1$$

cos est 2π-périodique :

$$\cos(\theta + 2\pi) = \cos\theta$$
$$\forall k \in \mathbf{Z},\ \cos(\theta + 2k\pi) = \cos\theta$$

cos est *pair* : $\cos(-\theta) = \cos\theta$

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

$$\cos(2a) = 2\cos^2 a - 1$$
$$= 1 - 2\sin^2 a$$

$$\cos(\pi - \theta) = -\cos\theta \qquad \sin(\pi - \theta) = \sin\theta$$
$$\cos(\pi + \theta) = -\cos\theta \qquad \sin(\pi + \theta) = -\sin\theta$$

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

Pythagore :
$$\forall\theta \in \mathbf{R}, \qquad \cos^2\theta + \sin^2\theta = 1$$

Formules de linéarisation :
$$\cos a \cos b = \frac{1}{2}\left(\cos(a+b) + \cos(a-b)\right)$$

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

Sinus

$$\mathbf{R} \xrightarrow{\sin} [-1,1]$$
$$\left[-\frac{\pi}{2}, \frac{\pi}{2}\right] \xleftarrow[\text{arcsin}]{} [-1,1]$$

$$-1 \leqslant \sin\theta \leqslant 1$$

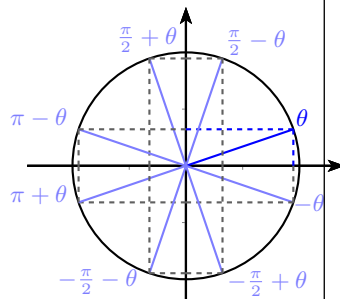sin est 2π-périodique :

$$\sin(\theta + 2\pi) = \sin\theta$$
$$\forall k \in \mathbf{Z},\ \sin(\theta + 2k\pi) = \sin\theta$$

sin est *impair* : $\sin(-\theta) = -\sin\theta$

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

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

Tangente

$$\mathbf{R} \setminus \left\{\frac{\pi}{2} + k\pi,\, k \in \mathbf{Z}\right\} \xrightarrow{\tan} \mathbf{R}$$
$$\left]-\frac{\pi}{2}, \frac{\pi}{2}\right[\xleftarrow[\text{arctan}]{} \mathbf{R}$$

tan est π périodique :

$$\tan(\theta + \pi) = \tan\theta$$
$$\forall k \in \mathbf{Z},\ \tan(\theta + k\pi) = \tan\theta$$

tan est *impaire* : $\tan(-\theta) = -\tan\theta$

$$\tan(\theta - \pi) = -\tan\theta$$
$$\tan(\theta + \pi) = \tan\theta$$

Angles remarquables :

θ	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$
$\cos\theta$	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0
$\sin\theta$	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1
$\tan\theta$	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	$\times$