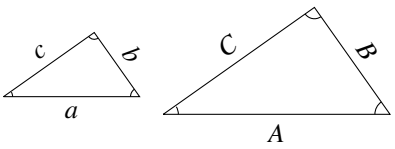
Formulaire de trigonométrie

Trigonométrie de base

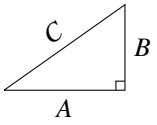
Similitude

Dans deux triangles semblables, les proportions des côtés correspondants sont toujours les mêmes.



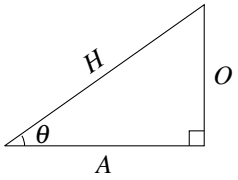
$$\frac{A}{a}=\frac{B}{b}=\frac{C}{c}$$
$$\frac{a}{c}=\frac{A}{C}\quad\frac{b}{c}=\frac{B}{c}\quad\text{etc.}$$

Thm. de Pythagore



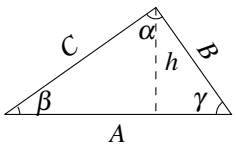
$$C^2=A^2+B^2$$

Rapports trigonométriques



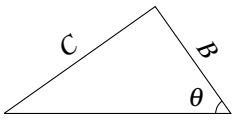
$$\sin(\theta)=\frac{O}{H}$$
$$\cos(\theta)=\frac{A}{H}$$
$$\tan(\theta)=\frac{O}{A}$$

Loi des sin



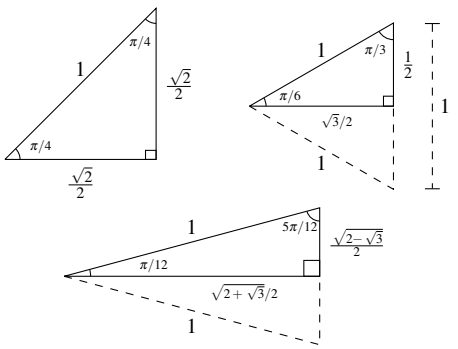
$$\frac{A}{\sin(\alpha)}=\frac{B}{\sin(\beta)}=\frac{C}{\sin(\gamma)}$$

Loi des cos

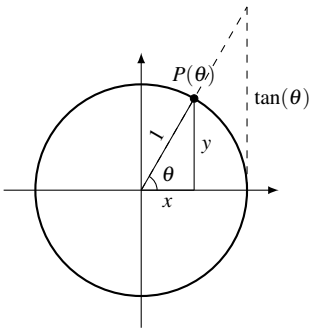


$$C^2=A^2+B^2-2AB\cos(\theta)$$

Triangles comportant des angles usuels

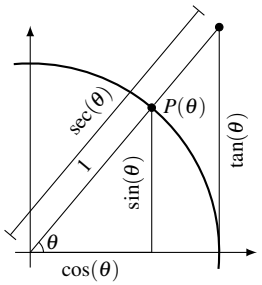


Cercle trigonométrique

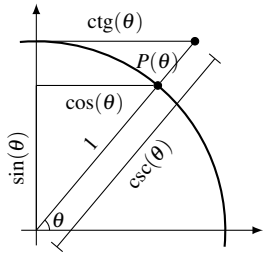


$$\cos(\theta)=x$$
$$\sin(\theta)=y$$
$$\cos^2(\theta)+\sin^2(\theta)=1$$
$$\tan(\theta)=\frac{y}{x}=\frac{\sin(\theta)}{\cos(\theta)}=\frac{\tan(\theta)}{1}$$

Cercle trigonométrique étendu

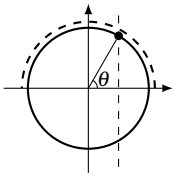


$$\frac{\tan(\theta)}{1}=\frac{\sin(\theta}{\cos(\theta)}$$
$$\frac{\sec(\theta)}{1}=\frac{1}{\cos(\theta)}$$
$$1+\tan^2(\theta)=\sec^2(\theta)$$

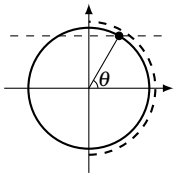


$$\frac{\text{ctg}(\theta)}{1}=\frac{\cos(\theta}{\sin(\theta)}$$
$$\frac{\csc(\theta)}{1}=\frac{1}{\sin(\theta)}$$
$$\text{ctg}^2(\theta)+1=\csc^2(\theta)$$

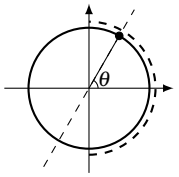
Fonctions trigonométriques inverses



$$\cos(\theta)=x\iff\theta=\text{acos}(x)$$
$$\text{acos}(x)\in[0,\pi]$$



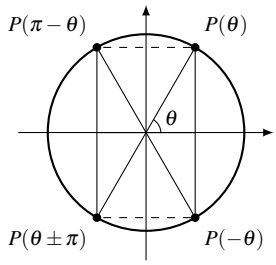
$$\sin(\theta)=y\iff\theta=\text{asin}(y)$$
$$\text{asin}(x)\in[-\pi/2,\pi/2]$$



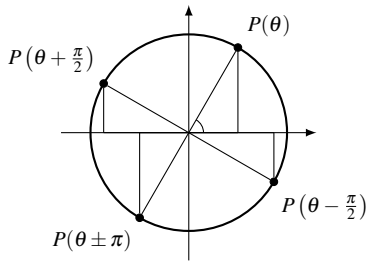
$$\tan(\theta)=m\iff\theta=\text{atan}(m)$$
$$\text{atan}(x)\in]-\pi/2,\pi/2[$$

Identitiés trigonométriques

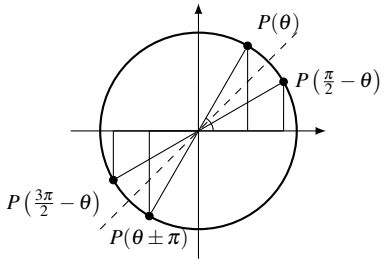
Symétries et rotations



$$\cos(-\theta)=\cos(\theta)$$
$$\sin(-\theta)=-\sin(\theta)$$
$$\cos(\pi-\theta)=-\cos(\theta)$$
$$\sin(\pi-\theta)=\sin(\theta)$$
$$\cos(\theta\pm\pi)=-\cos(\theta)$$
$$\sin(\theta\pm\pi)=-\sin(\theta)$$

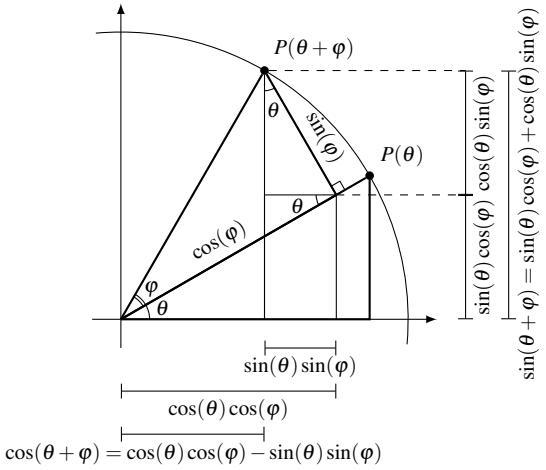


$$\cos\left(\theta+\frac{\pi}{2}\right)=-\sin(\theta)$$
$$\sin\left(\theta+\frac{\pi}{2}\right)=\cos(\theta)$$
$$\cos\left(\theta-\frac{\pi}{2}\right)=\sin(\theta)$$
$$\sin\left(\theta-\frac{\pi}{2}\right)=-\cos(\theta)$$



$$\cos\left(\frac{\pi}{2}-\theta\right)=\sin(\theta)$$
$$\sin\left(\frac{\pi}{2}-\theta\right)=\cos(\theta)$$
$$\cos\left(\frac{3\pi}{2}-\theta\right)=-\sin(\theta)$$
$$\sin\left(\frac{3\pi}{2}-\theta\right)=-\cos(\theta)$$

Somme d'angles



Multiples d'angles

$$\sin(2\theta)=2\sin(\theta)\cos(\theta)\quad\cos(2\theta)=\cos^2(\theta)-\sin^2(\theta)$$

Carrés de sinus et cosinus

$$\sin^2(\theta)=\frac{1-\cos(2\theta)}{2}\quad\cos^2(\theta)=\frac{1+\cos(2\theta)}{2}$$

Produits de sinus et cosinus

$$\sin(\theta)\cos(\varphi)=\frac{\sin(\theta-\varphi)+\sin(\theta+\varphi)}{2}$$
$$\cos(\theta)\sin(\varphi)=\frac{\sin(\theta-\varphi)+\sin(\theta+\varphi)}{2}$$
$$\cos(\theta)\cos(\varphi)=\frac{\cos(\theta-\varphi)+\cos(\theta+\varphi)}{2}$$
$$\sin(\theta)\sin(\varphi)=\frac{\cos(\theta-\varphi)-\cos(\theta+\varphi)}{2}$$