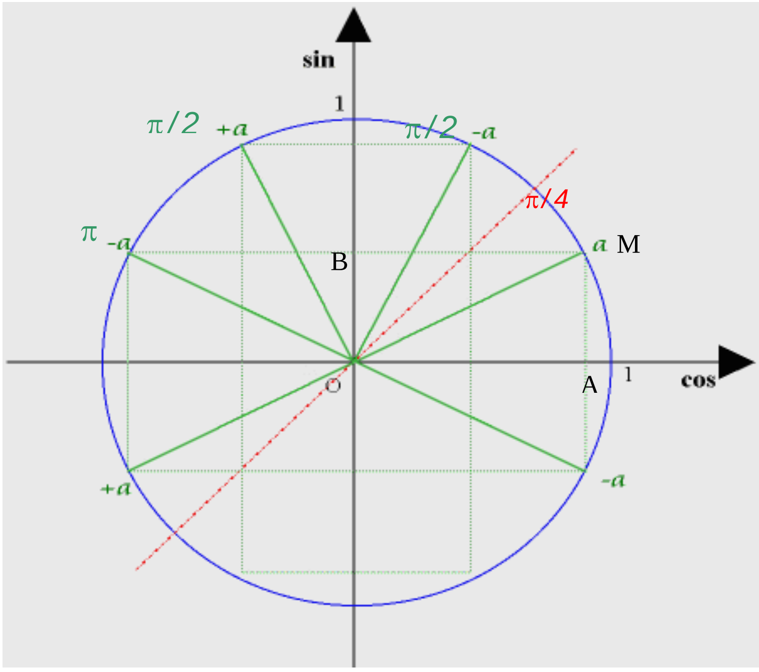
TRIGONOMETRIE

CERCLE TRIGONOMETRIQUE

Dans un repère orthonormé, cercle de rayon 1, orienté dans le sens inverse de l'horloge



toujours compris entre 0 et 1

$$\sin \boldsymbol{a} = \frac{\boldsymbol{AM}}{\boldsymbol{OM}} = \overline{\boldsymbol{OB}}$$

$$\cos \boldsymbol{a} = \frac{\boldsymbol{BM}}{\boldsymbol{OM}} = \overline{\boldsymbol{OA}}$$

$$\tan \boldsymbol{a} = \frac{\boldsymbol{AM}}{\boldsymbol{OA}} = \frac{\sin \boldsymbol{a}}{\cos \boldsymbol{a}}$$

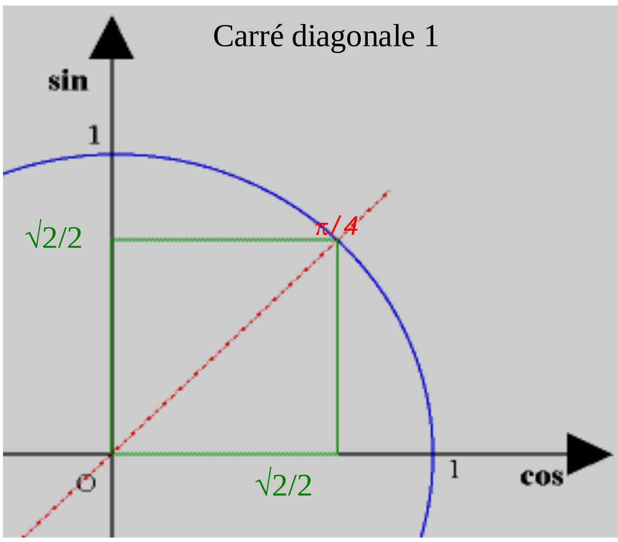
Mesure des angles :

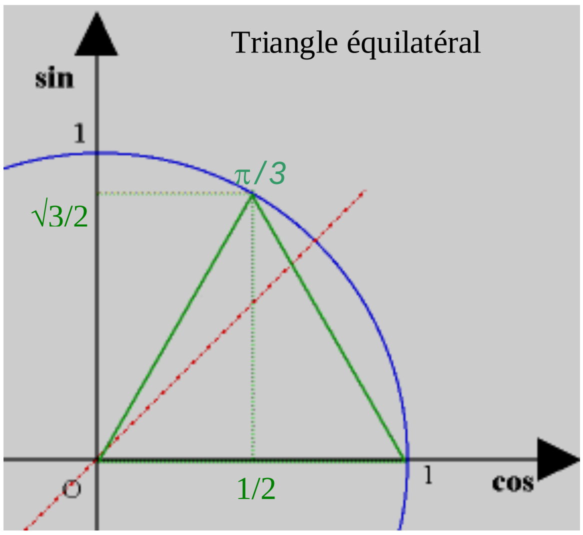
Mesure en radians = ***$\underline{\text{Longueur de l'arc}}$***
rayon du cercle

Sur le cercle trigonométrique :

a **(rd) = longueur de l'arc /1**

degrés	0	30	45	60	90	180
radians	0	π/6	π/4	π/3	π/2	π
grades	0	100/3	50	200/3	100	200
sin	0	1/2	√2/2	√3/2	1	0
cos	1	√3/2	√2/2	1/2	0	-1
tan	0	√3/3	1	√3	∞	0





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Formules de base :

Relations de base	*Se lisent sur le cercle trigonométrique*	
$\cos^2 \theta + \sin^2 \theta = 1$		
$\cos(-\theta) = \cos\theta$ $\cos(\pi - \theta) = -\cos\theta$ $\cos(\pi + \theta) = -\cos\theta$ $\cos(\pi/2 - \theta) = \sin\theta$ $\cos(\pi/2 + \theta) = -\sin\theta$	$\sin(-\theta) = -\sin\theta$ $\sin(\pi - \theta) = \sin\theta$ $\sin(\pi + \theta) = -\sin\theta$ $\sin(\pi/2 - \theta) = \cos\theta$ $\sin(\pi/2 + \theta) = \cos\theta$	$\tan(-\theta) = -\tan\theta$ $\text{cotan}(-\theta) = -\text{cotan}\,\theta$
Formules d'addition	*à savoir par coeur*	
$\cos(a + b) = \cos a \cos b - \sin a \sin b$ $\cos(a - b) = \cos a \cos b + \sin a \sin b$	$\sin(a + b) = \sin a \cos b + \cos a \sin b$ $\sin(a - b) = \sin a \cos b - \cos a \sin b$	$\tan(a + b) = \dfrac{\tan a + \tan b}{1 - \tan a \tan b}$ $\tan(a - b) = \dfrac{\tan a - \tan b}{1 + \tan a \tan b}$
$\cos 2a = \cos^2 a - \sin^2 a = 2\cos^2 a - 1$ $\cos 2a = 1 - 2\sin^2 a$ $\cos^2 a = \dfrac{1 + \cos 2a}{2}$	$\sin 2a = 2 \sin a \cos a$ $\sin^2 a = \dfrac{1 - \cos 2a}{2}$	$\tan 2a = \dfrac{2\tan a}{1 - \tan^2 a}$ $1 + \tan^2 a = 1/\cos^2 a$
Formules de linéarisation		$t = \tan\theta/2$
$\cos\theta = \dfrac{1 - t^2}{1 + t^2}$	$\sin\theta = \dfrac{2t}{1 + t^2}$	$\tan\theta = \dfrac{2t}{1 - t^2}$

Relations dans le triangle :

Aire : ***S = ½ bc sin A = ½ ca sin B = ½ ab sin C***

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} = \frac{abc}{2S}$$