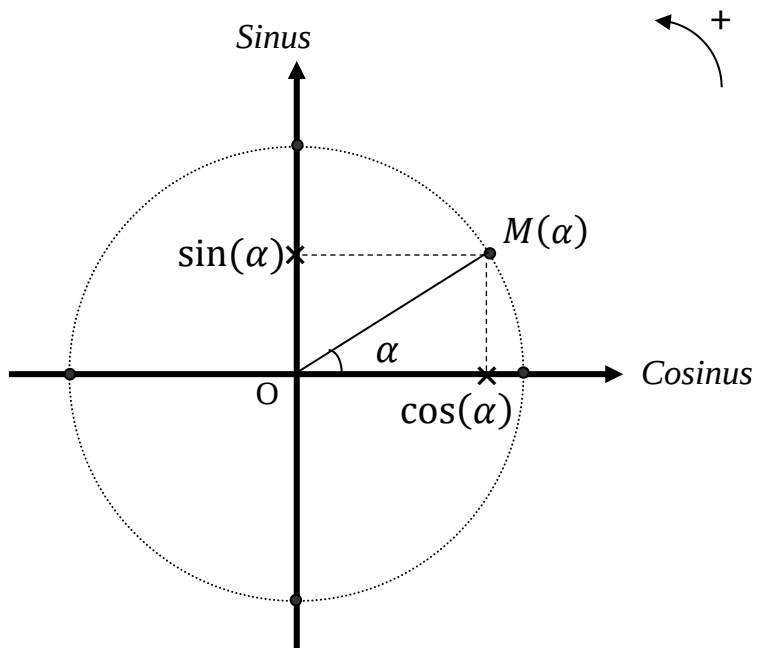
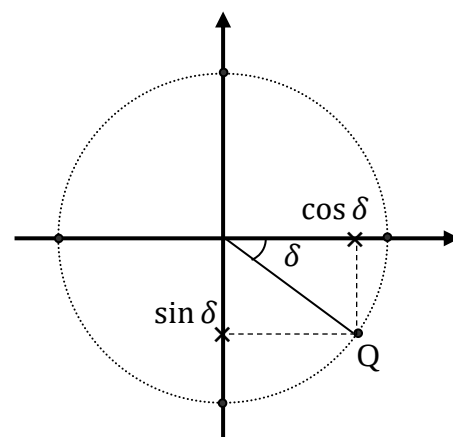
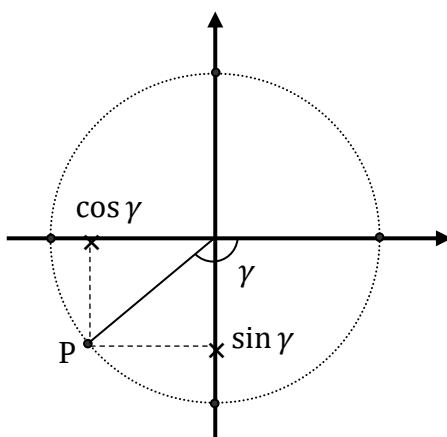
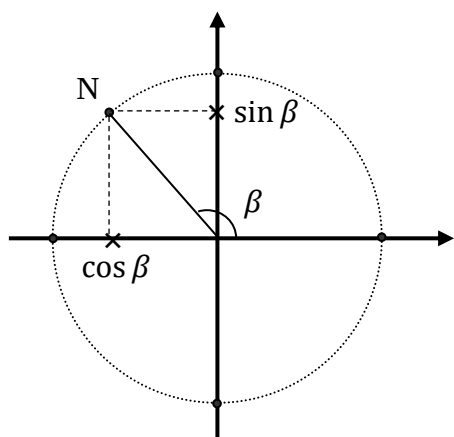


Sinus et cosinus

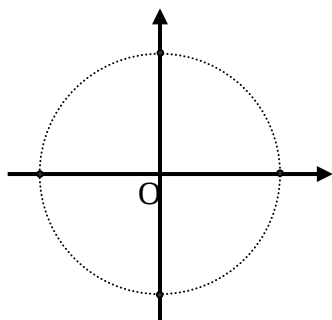


Coordonnées de M

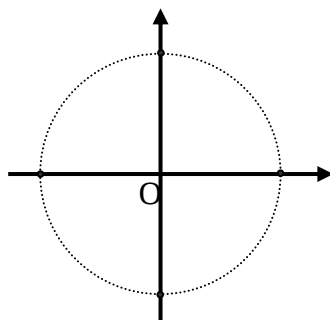
$$\cos^2 \alpha + \sin^2 \alpha = 1$$



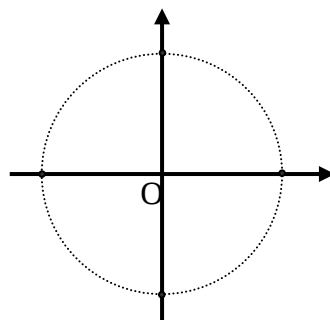
Points particulier – exemples



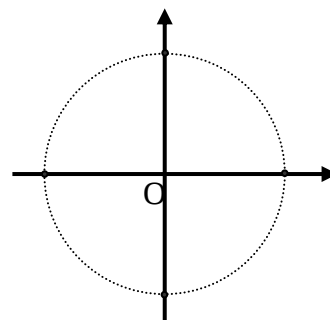
$A(1 ; 0)$
Angle $\alpha =$
 $\cos$
 $\sin$



$B(0 ; 1)$
Angle $\beta =$
 $\cos$
 $\sin$

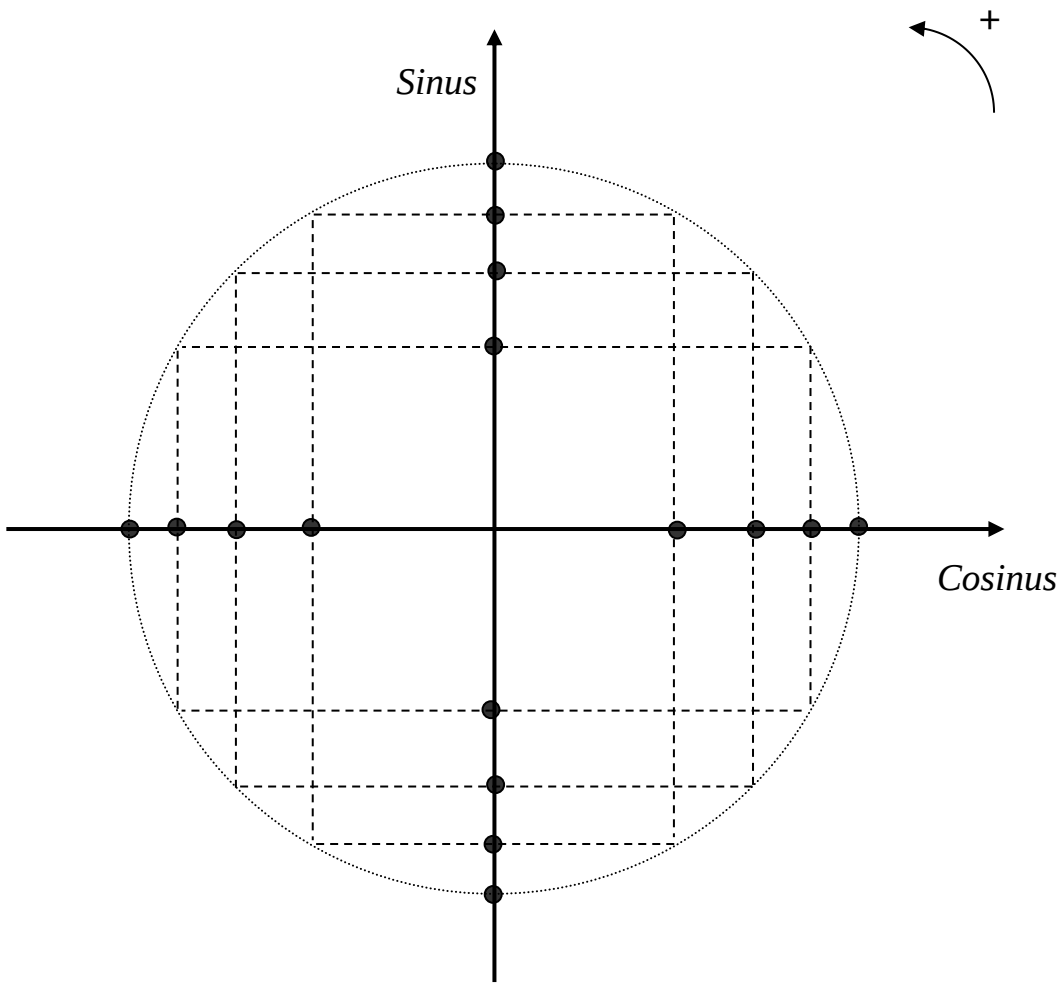


$C(-1 ; 0)$
Angle $\gamma =$
 $\cos$
 $\sin$



$D(0 ; -1)$
Angle $\delta =$
 $\cos$
 $\sin$

Sinus et cosinus



Valeurs remarquables

α	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$
$\cos \alpha$					
$\sin \alpha$					

Démonstrations des valeurs remarquables

1) Triangle rectangle isocèle

ABC triangle isocèle rectangle en A de côté $AB = AC = a$

Donc $\hat{B} = \hat{C} = \frac{\pi}{4}$

On a aussi, d'après le théorème de Pythagore :

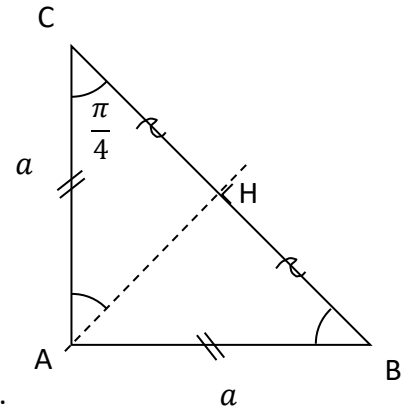
$$BC^2 = AB^2 + AC^2 = a^2 + a^2 = 2a^2 \quad \text{donc} \quad BC = \sqrt{2a^2} = a\sqrt{2}$$

ABC est isocèle en A, donc la médiane et la hauteur issue de A sont confondues.

Donc ACH est un triangle rectangle dans lequel on a :

$$\cos \hat{C} = \frac{CH}{CA} \Leftrightarrow \cos \frac{\pi}{4} = \frac{\frac{a\sqrt{2}}{2}}{a} = \frac{a\sqrt{2}}{2} \times \frac{1}{a} = \frac{\sqrt{2}}{2}$$

On a aussi $\widehat{CAH} = \frac{\pi}{4}$ (car AH est aussi la bissectrice), donc on montre de même que $\sin \frac{\pi}{4} = \frac{\sqrt{2}}{2}$



2) Triangle équilatéral

ABC triangle équilatéral de côté a dont les 3 angles sont de $\frac{\pi}{3}$

Médianes, hauteurs et bissectrices sont confondues :

le triangle ABH est rectangle en H et :

$$BH = CH = \frac{a}{2} \quad \text{et} \quad \widehat{BAH} = \pi - \frac{\pi}{2} - \frac{\pi}{3} = \frac{\pi}{6}$$

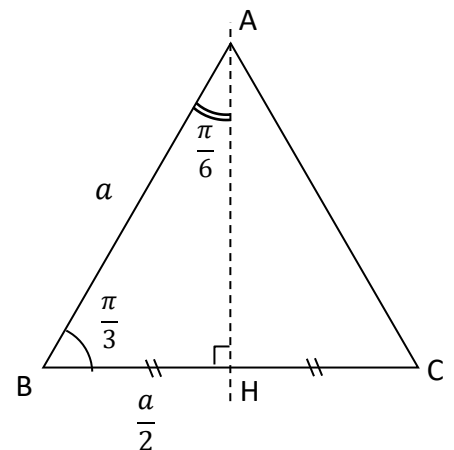
On a aussi, d'après le théorème de Pythagore :

$$AB^2 = AH^2 + HB^2 \Leftrightarrow a^2 = AH^2 + \left(\frac{a}{2}\right)^2 \Leftrightarrow AH^2 = a^2 - \frac{a^2}{4} = \frac{3a^2}{4}$$

$$\text{Donc} \quad AH = \sqrt{\frac{3a^2}{4}} = \frac{a\sqrt{3}}{2}$$

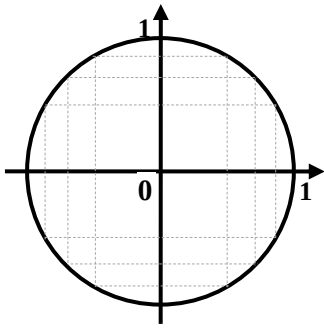
$$\sin \hat{B} = \frac{AH}{AB} \Leftrightarrow \sin \frac{\pi}{3} = \frac{\frac{a\sqrt{3}}{2}}{a} = \frac{a\sqrt{3}}{2} \times \frac{1}{a} = \frac{\sqrt{3}}{2} \quad \text{et du coup :} \quad \cos \widehat{BAH} = \frac{AH}{AB} \Leftrightarrow \cos \frac{\pi}{6} = \frac{\sqrt{3}}{2}$$

$$\cos \hat{B} = \frac{BH}{AB} \Leftrightarrow \cos \frac{\pi}{3} = \frac{\frac{a}{2}}{a} = \frac{a}{2} \times \frac{1}{a} = \frac{1}{2} \quad \text{et du coup :} \quad \sin \widehat{BAH} = \frac{BH}{AB} \Leftrightarrow \sin \frac{\pi}{6} = \frac{1}{2}$$

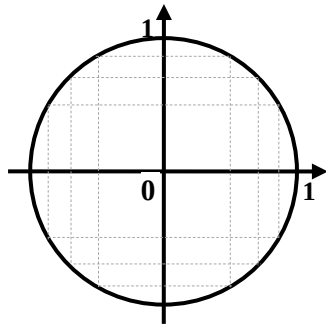


Sinus et cosinus - Exemples

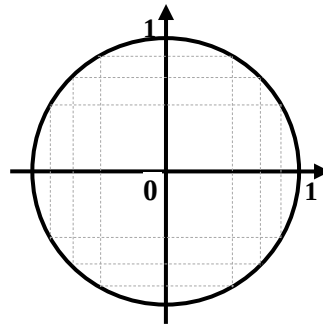
1) Déterminer le sinus ou le cosinus d'un angle



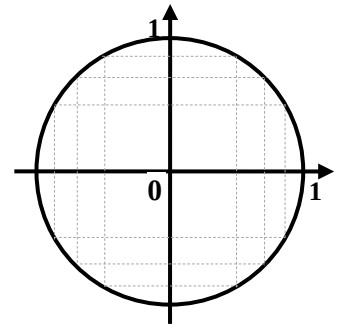
$$\cos \frac{2\pi}{3} =$$



$$\sin \frac{5\pi}{4} =$$

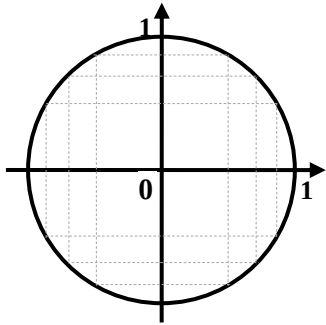


$$\cos \left(-\frac{\pi}{4} \right) =$$



$$\tan \frac{5\pi}{6} =$$

2) Placer un point/déterminer un angle à partir de ses sinus et cosinus

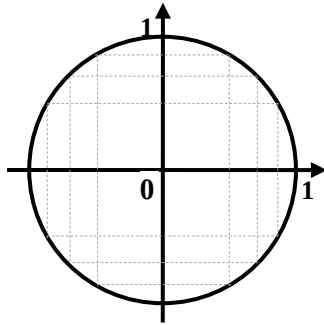


$$M \left(-\frac{\sqrt{2}}{2} ; \frac{\sqrt{2}}{2} \right)$$

$$\cos \mu =$$

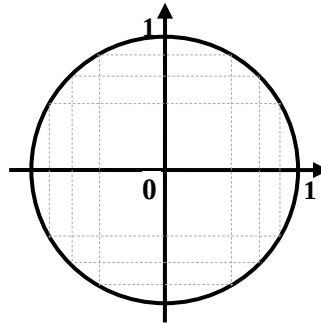
$$\sin \mu =$$

$$\text{Angle } \mu =$$



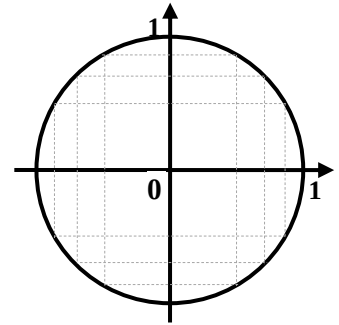
$$N \left(\frac{1}{2} ; -\frac{\sqrt{3}}{2} \right)$$

$$\text{Angle } \nu =$$



$$P \left(\frac{\sqrt{3}}{2} ; \frac{1}{2} \right)$$

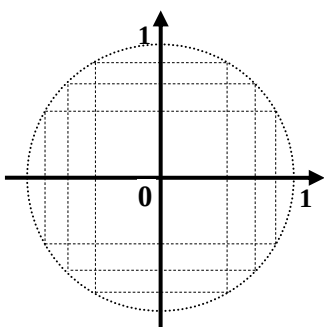
$$\text{Angle } \rho =$$



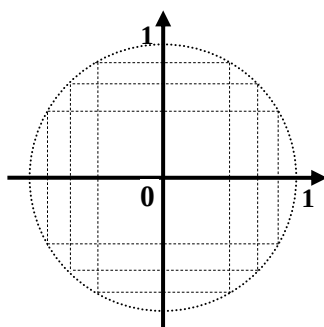
$$Q \left(-\frac{1}{2} ; -\frac{\sqrt{3}}{2} \right)$$

$$\text{Angle } \theta =$$

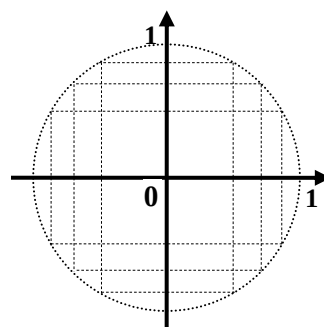
3) Résoudre une équation trigonométrique dans $[0 ; 2\pi[$



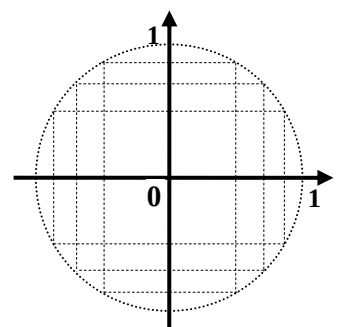
$$\cos \alpha = -\frac{1}{2}$$



$$\sin \beta = 0$$



$$\sin \gamma = -1$$



$$\cos \delta = \frac{\sqrt{3}}{2}$$