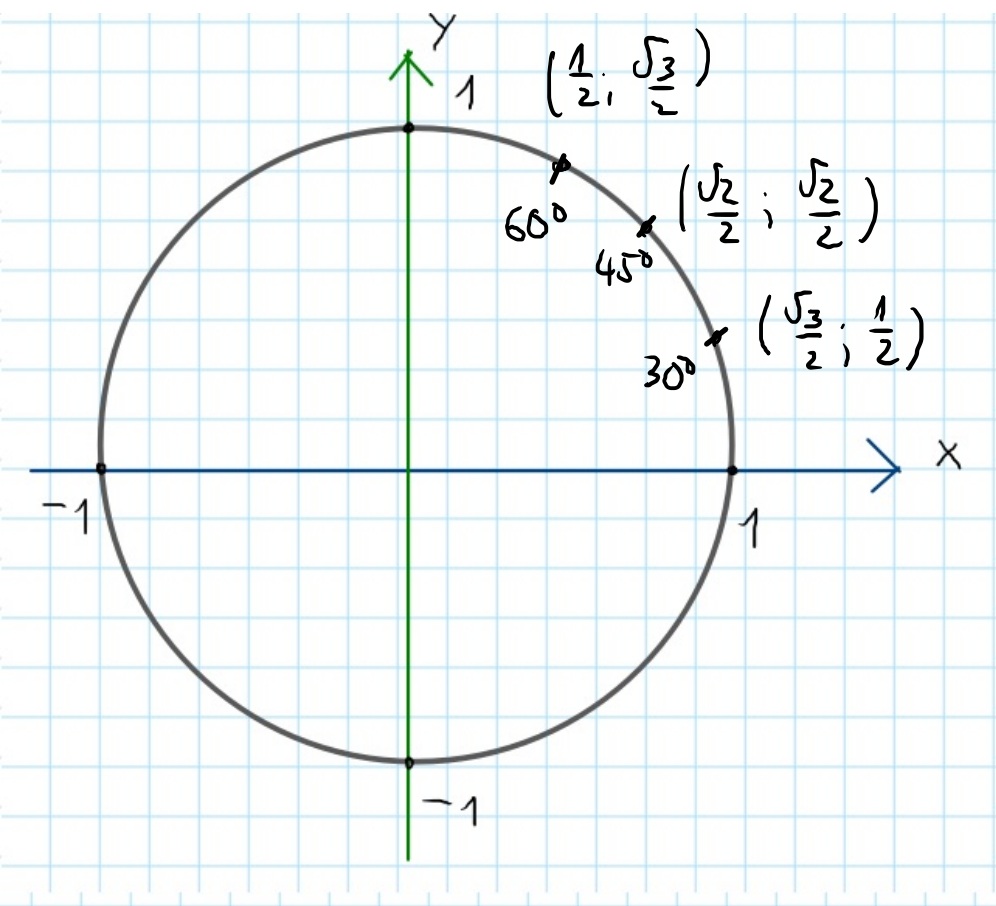


05.04.22

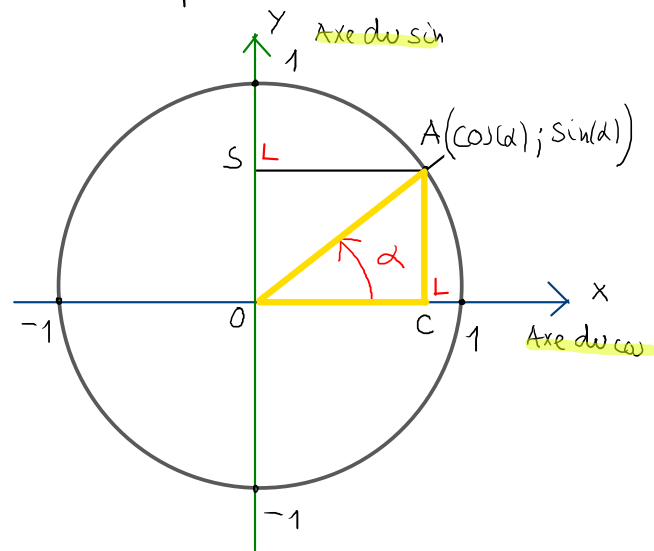
4.3.1. Déterminer les valeurs exactes des rapports trigonométriques des angles de 45° , 30° et 60° .

	$\sin$	$\cos$	$\tan$
0°	0	1	0
30°	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{3}}{3}$
45°	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	1
60°	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$
90°	1	0	impossible



Cercle trigonométrique

But : calculer $\sin(\alpha)$, $\cos(\alpha)$ et $\tan(\alpha)$ pour tout α , lorsque c'est possible



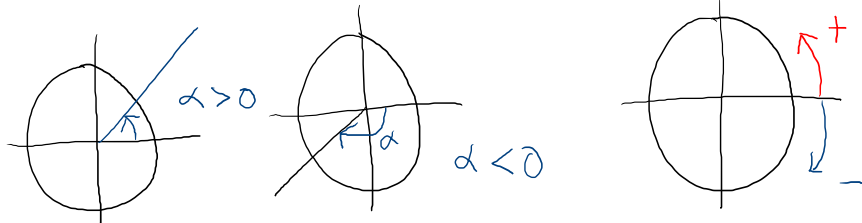
$\triangle OCA$ rectangle en C :

$$\sin(\alpha) = AC = OS$$

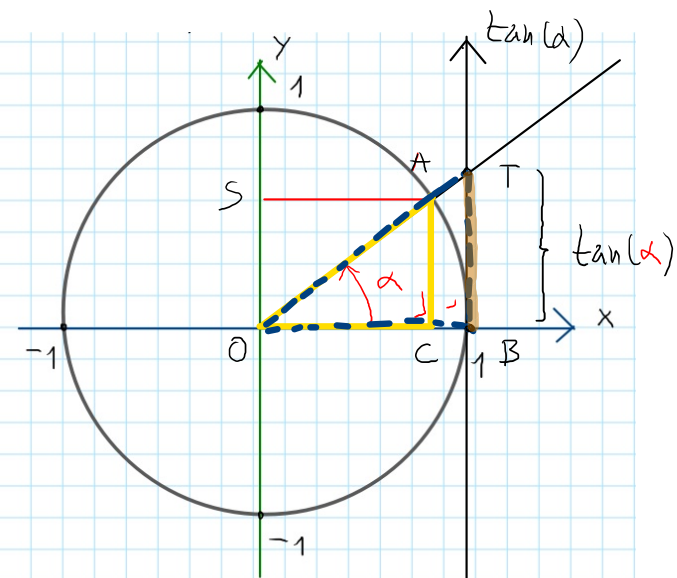
$$\cos(\alpha) = OC$$

$$\tan(\alpha) = \frac{AC}{OC} = \frac{OS}{OC} = \frac{\sin(\alpha)}{\cos(\alpha)}$$

Sens trigonométrique



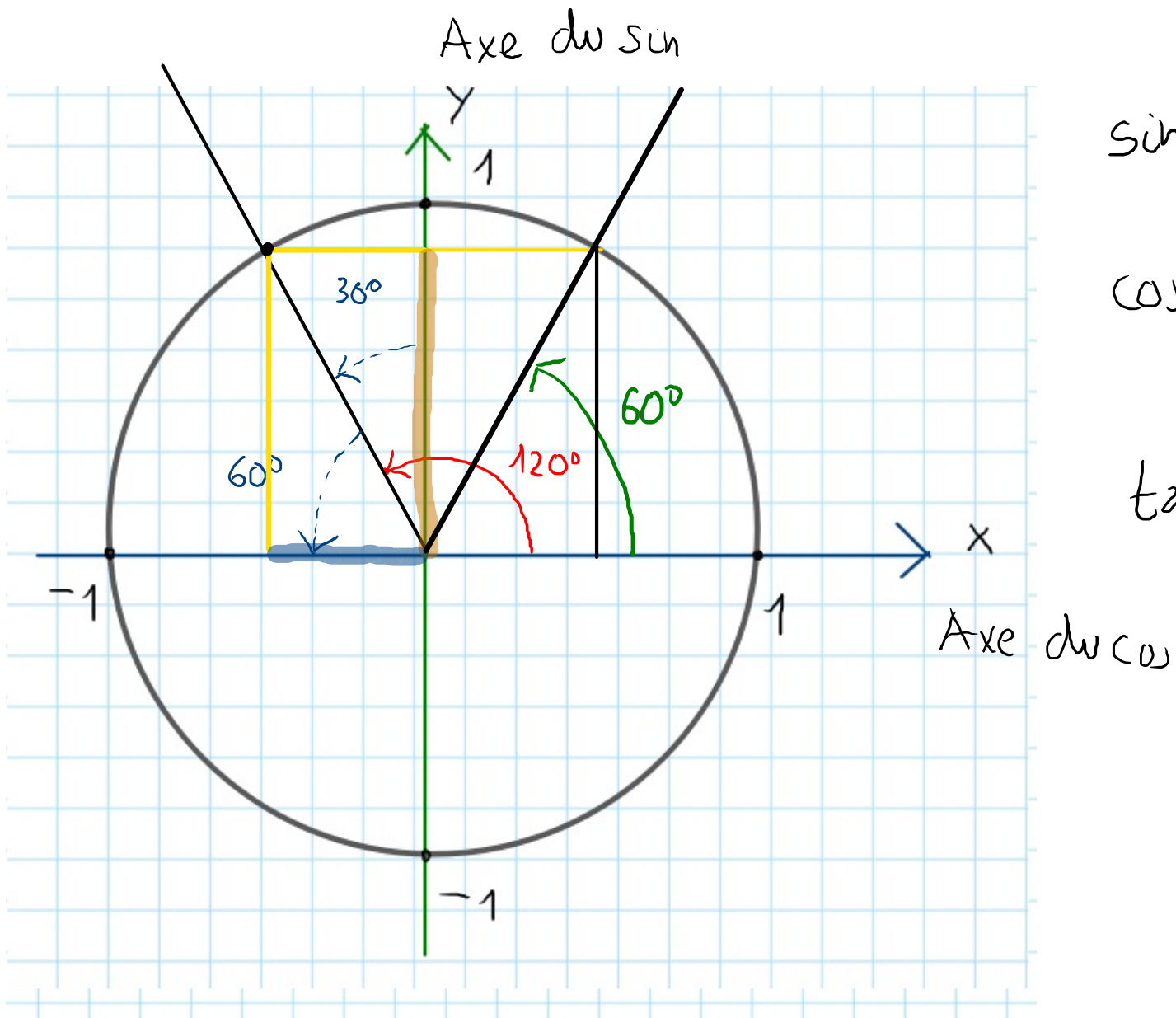
Axe de la tangente



Thalès :

$$\tan(\alpha) = \frac{AC}{OC} = \frac{TB}{1} = TB$$

Calculons les rapports trigonométriques de 120°



$$\sin(120^\circ) = \sin(60^\circ) = \frac{\sqrt{3}}{2}$$

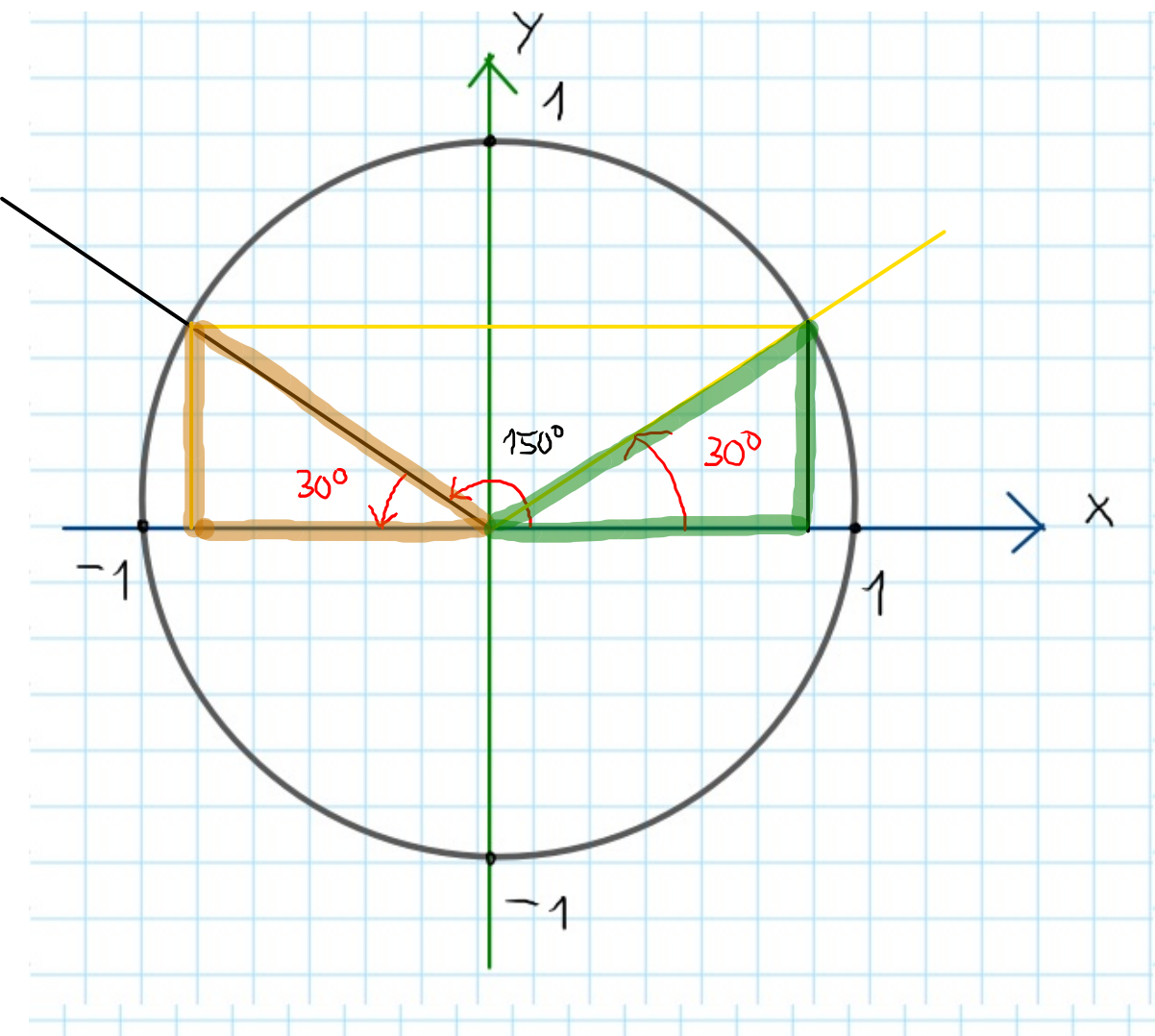
$$\cos(120^\circ) = -\cos(60^\circ) = -\frac{1}{2}$$

$$\tan(120^\circ) = \frac{\frac{\sqrt{3}}{2}}{-\frac{1}{2}} = -\sqrt{3}$$

Calculer les rapports trigonométriques de :

$$\alpha_1 = 150^\circ, \quad \alpha_2 = -60^\circ, \quad \alpha_3 = -120^\circ$$

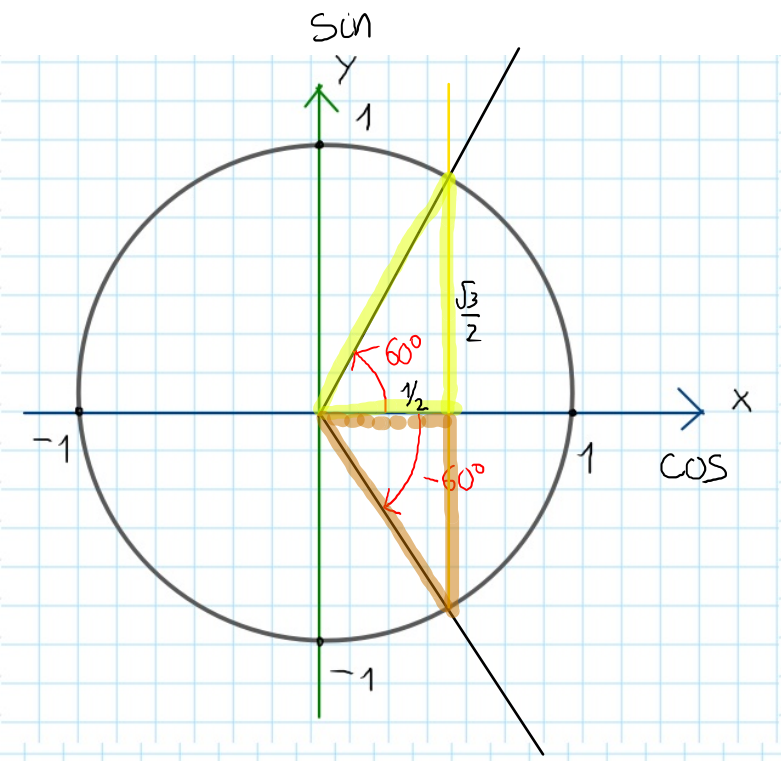
$$\alpha_4 = 180^\circ \quad \text{et} \quad \alpha_5 = 270^\circ$$



$$\sin(150^\circ) = \sin(30^\circ) = \frac{1}{2}$$

$$\cos(150^\circ) = -\cos(30^\circ) = -\frac{\sqrt{3}}{2}$$

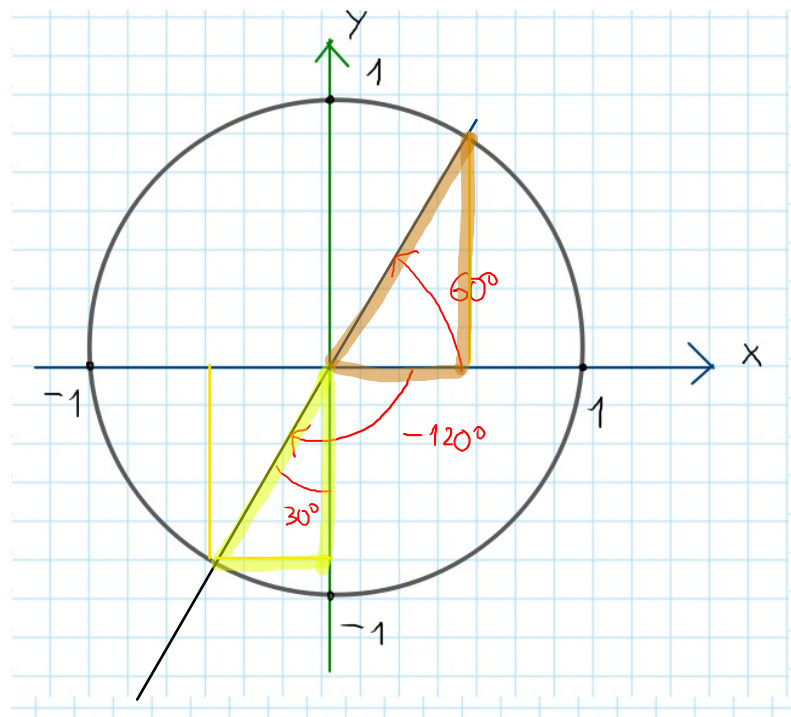
$$\tan(150^\circ) = -\frac{1}{\sqrt{3}} = -\frac{\sqrt{3}}{3}$$



$$\sin(-60^\circ) = -\sin(60^\circ) = -\frac{\sqrt{3}}{2}$$

$$\cos(-60^\circ) = \cos(60^\circ) = \frac{1}{2}$$

$$\tan(-60^\circ) = -\sqrt{3}$$



$$\sin(-120^\circ) = -\frac{\sqrt{3}}{2}$$

$$\cos(-120^\circ) = -\frac{1}{2}$$

$$\tan(-120^\circ) = \frac{-\frac{\sqrt{3}}{2}}{-\frac{1}{2}} = \sqrt{3}$$

$$\sin(180^\circ) = 0$$

$$\cos(180^\circ) = -1$$

$$\tan(180^\circ) = 0$$

$$\sin(270^\circ) = -1$$

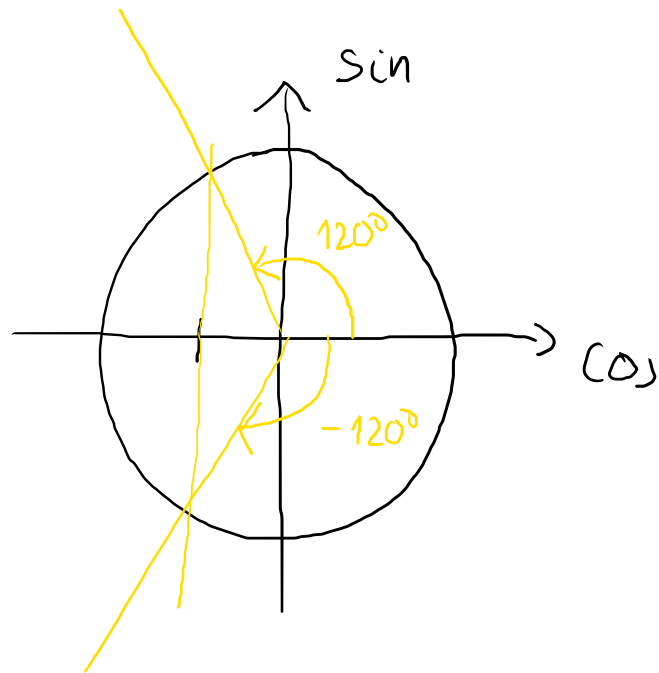
$$\cos(270^\circ) = 0$$

$$\tan(270^\circ) = \text{pas défini}$$

4.3.3

$$a) \cos(t) = -\frac{1}{2} \quad \Rightarrow \quad \boxed{|T|} \quad t = 120^\circ$$

$$t_1 = 120^\circ + K \cdot 360^\circ, \quad K \in \mathbb{Z}$$



$$\begin{cases} t_1 = 120^\circ + K \cdot 360^\circ \\ t_2 = 240^\circ + K \cdot 360^\circ \end{cases} \quad K \in \mathbb{Z}$$

$$t_2 = -120^\circ + K \cdot 360^\circ, \quad K \in \mathbb{Z}$$

$$t_2 = 240^\circ + K \cdot 360^\circ$$