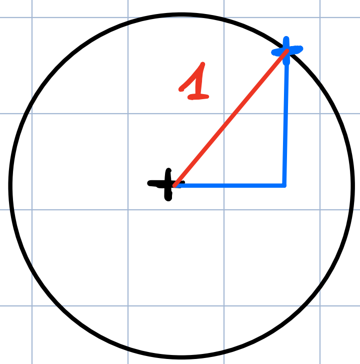
Trigonométrie



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

- $\cos(\alpha) = \cos(-\alpha)$ paire
- $\sin(\alpha) = -\sin(-\alpha)$ impaire

- $\sin(\alpha + \pi/2) = \cos(\alpha)$
- $\cos(\alpha + \pi/2) = -\sin(\alpha)$

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

- $\cos(\alpha - \pi/2) = \sin(\alpha)$
- $\sin(\alpha - \pi/2) = \cos(\alpha)$

- $\cos(\quad) = \sin(\alpha)$
- $\sin(\quad) = \cos(\alpha)$

	45°	60°	30°	0°	90°
	$\pi/4$	$\pi/3$	$\pi/6$	0	$\frac{\pi}{2}$
cos	$\frac{\sqrt{2}}{2}$	$1/2$	$\frac{\sqrt{3}}{2}$	1	0
sin	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	$1/2$	0	1
tan	1	$\sqrt{3}$	$\frac{\sqrt{3}}{3}$	0	undef (tend vers $\pm\infty$)
cot	1	$\frac{\sqrt{3}}{3}$	$\sqrt{3}$	pasdef	0

$$\tan \alpha = \frac{\sin \alpha}{\cos \alpha}$$

tan: $D_{tan} \to \mathbb{R}$

$D_{tan} = \mathbb{R} \setminus \left\{ \frac{\pi}{2} + k\pi, k \in \mathbb{Z} \right\}$

$$\cot \alpha = \frac{\cos \alpha}{\sin \alpha}$$

cot: $D_{cot} \to \mathbb{R}$

$D_{cot} = \mathbb{R} \setminus \{ k\pi : k \in \mathbb{Z} \}$

arcsin: $[-1,1] \to \left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$

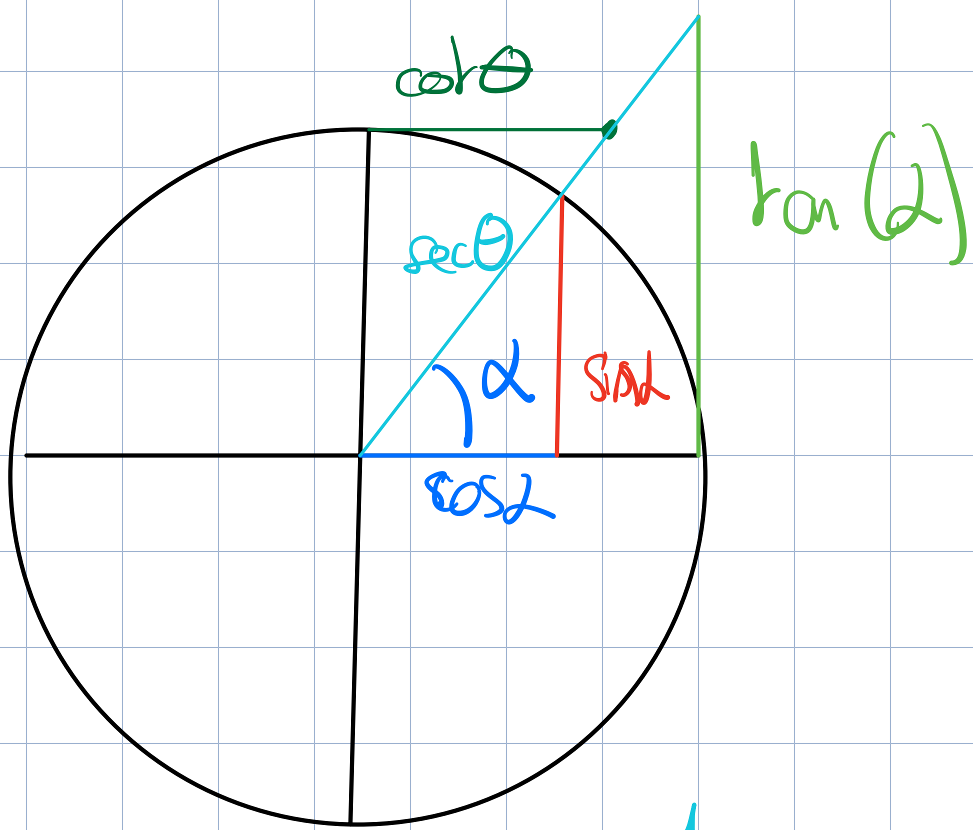
$y \mapsto \arcsin(y)$

arccos : $[-1,1] \to [0,\pi]$

$x \mapsto \arccos(x)$

$$1 + \tan^2 \alpha = \frac{1}{\cos^2 \alpha} \quad (\alpha \in D_{\tan})$$

$$1 + \cot^2 \alpha = \frac{1}{\sin^2 \alpha} \quad (\alpha \in D_{\cot})$$



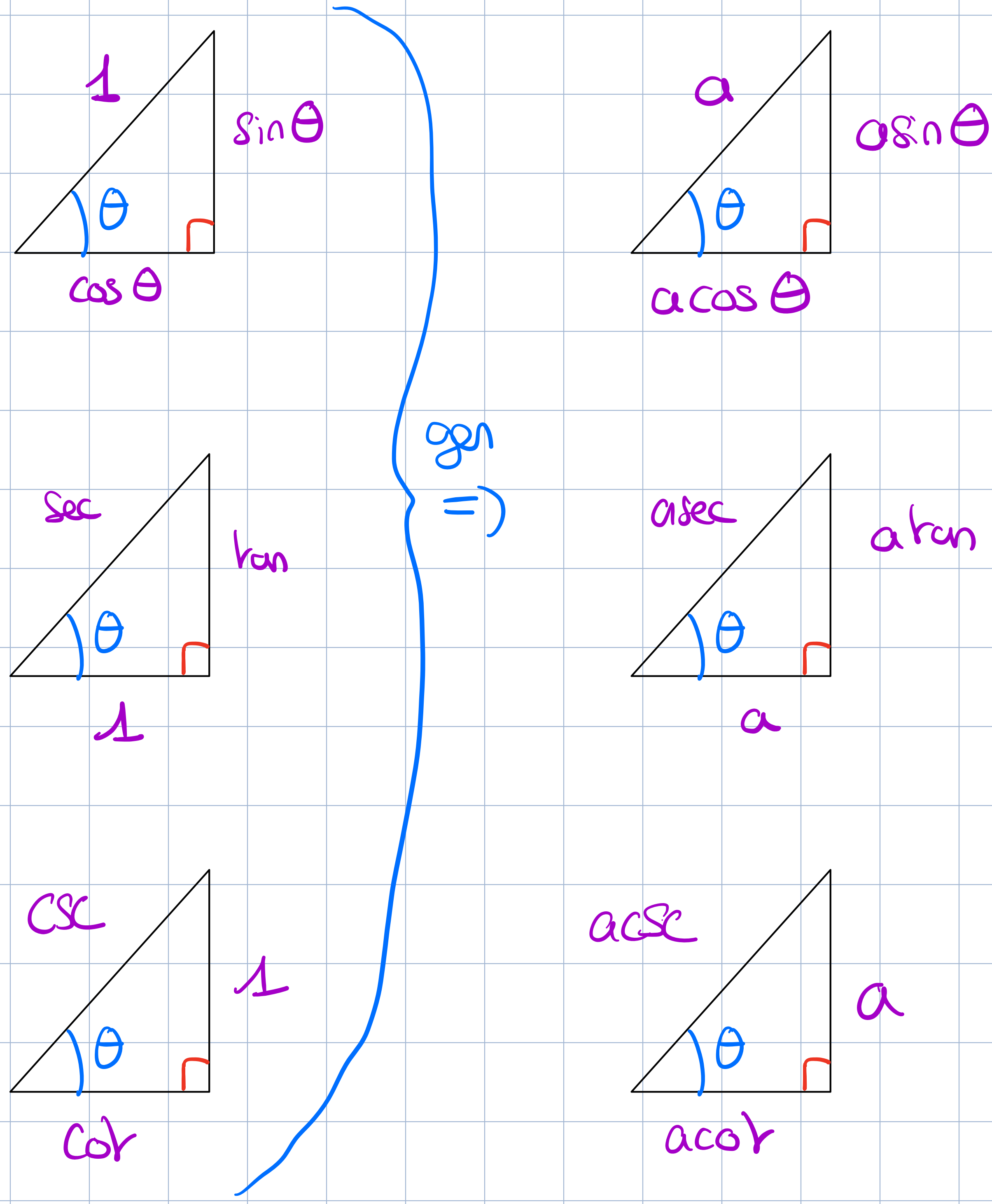
$$\tan\theta = \frac{\sin\theta}{\cos\theta}$$

$$\sec\theta = \frac{1}{\cos\theta}$$

(coupe la tangente)

$$\cot\theta = \frac{1}{\tan\theta}$$

$$\csc\theta = \frac{1}{\sin\theta}$$


1
sin θ
θ
cos θ
a
a sin θ
θ
a cos θ
gen
=)
sec
tan
θ
1
a sec
a tan
θ
a
csc
1
θ
cot
a csc
a
θ
a cot

Tangente

$$\lim_{\alpha \to \left(\frac{\pi}{2}+k\pi\right)^-} \tan \alpha = +\infty$$

$$\lim_{\alpha \to \left(\frac{\pi}{2}+k\pi\right)^+} \tan \alpha = -\infty$$

Cotangente

$$\lim_{\alpha \to (k\pi)^-} \cot \alpha = -\infty$$

$$\lim_{\alpha \to (k\pi)^+} \cot \alpha = +\infty$$

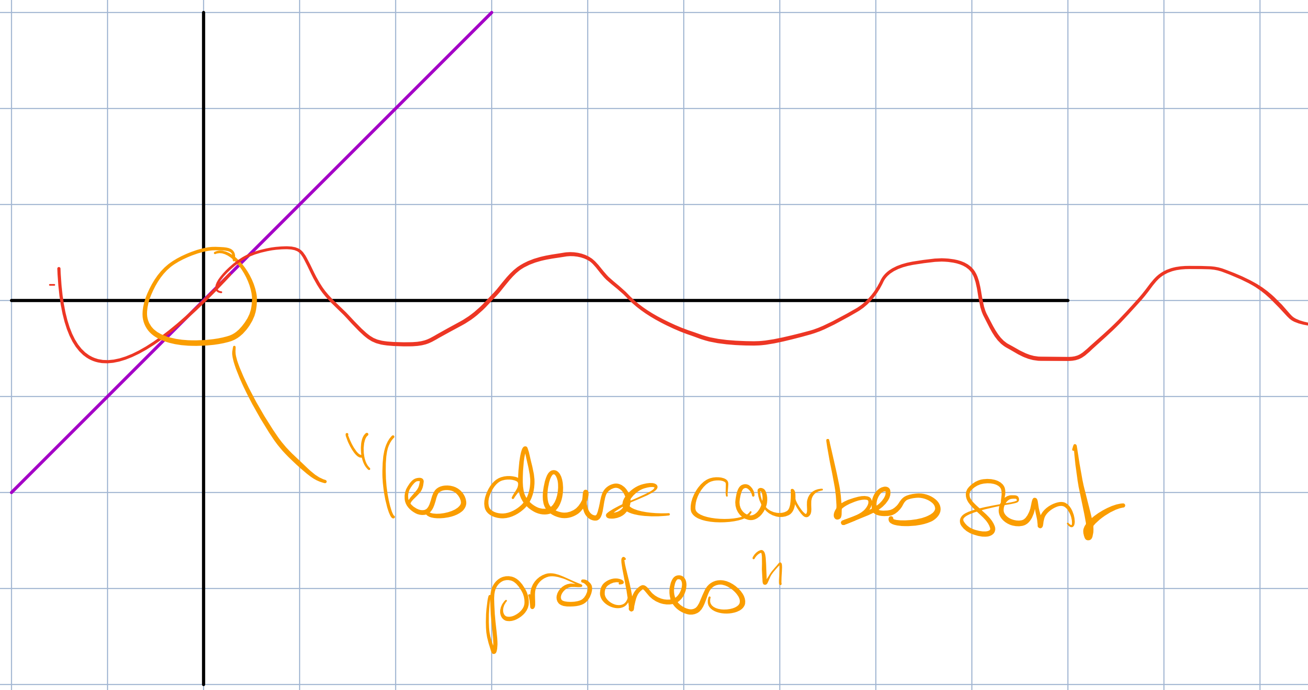
Dérivée

$$\cos'(\omega_1 x) = -\omega_1 \sin(\omega_1 x)$$

$$\sin'(\omega_2 x) = \omega_2 \cos(\omega_2 x)$$

$$\tan'(\omega_3 x) = \frac{\omega_3}{\cos(\omega_3 x)}$$

Pourquoi $\theta \simeq \sin\theta$ pour petits θ ?



Formules d'addition

- $\cos(a+b) = \cos(a)\cos(b) - \sin(a)\sin(b)$
- $\sin(a+b) = \sin(a)\cos(b) + \cos(a)\sin(b)$
- $\tan(a+b) = \dfrac{\tan(a) + \tan(b)}{1 - \tan(a)\tan(b)}$

- $\cos(a-b) = \cos(a)\cos(b) + \sin(a)\sin(b)$
- $\sin(a-b) = \sin(a)\cos(b) - \cos(a)\sin(b)$
- $\tan(a-b) = \dfrac{\tan(a) - \tan(b)}{1 + \tan(a)\tan(b)}$

Formules d'angle double

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

- $\sin(2x) = 2\sin(x)\cos(x)$

- $\tan(2x) = \dfrac{2\tan(x)}{1-\tan^2(x)}$

Formules du demi-angle

- $\cos^2(x) = \dfrac{1+\cos(2x)}{2}$

- $\sin^2(x) = \dfrac{1-\cos(2x)}{2}$