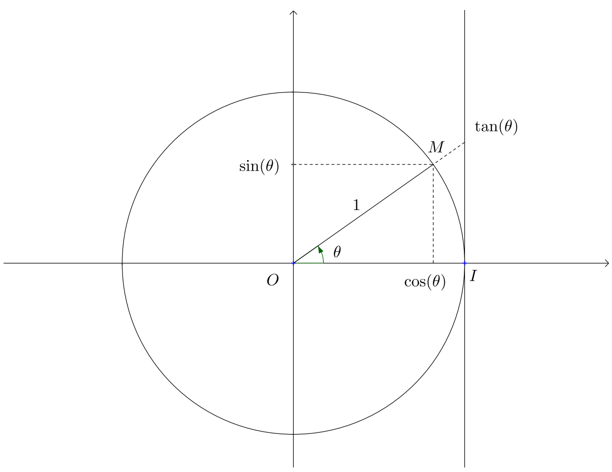
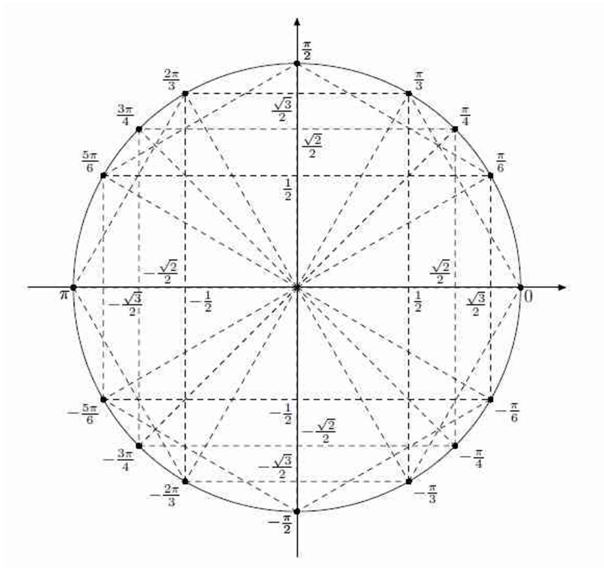
Fiche de révision — Trigonométrie

Cercle trigonométrique



Valeurs remarquables



Symétrie, périodicité.

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

Tangente

- $D_{\tan} = \bigcup_{k\in\mathbb{Z}} \left]k\pi - \frac{\pi}{2}\ ;\ k\pi + \frac{\pi}{2}\right[$
- $\tan(x) = \dfrac{\sin(x)}{\cos(x)}$
- $\forall \theta \in D_{tan}, \quad \tan(-\theta) = -\tan(\theta)$
- $\forall \theta \in D_{tan}, \quad \tan(\theta + \pi) = \tan(\theta)$
- $\forall \theta \in D_{tan}$ et si $\tan(\theta) \neq 0$,
$$\tan\left(\frac{\pi}{2} - \theta\right) = \frac{1}{\tan(\theta)}$$

Formules

- $\cos^2(\theta) + \sin^2(\theta) = 1.$
- $\cos(\alpha + \beta) = \cos(\alpha)\cos(\beta) - \sin(\alpha)\sin(\beta)$
- $\sin(\alpha + \beta) = \sin(\alpha)\cos(\beta) + \cos(\alpha)\sin(\beta)$
- $\sin(2\theta) = 2\sin(\theta)\cos(\theta)$
- $\cos(2\theta) = \cos^2(\theta) - \sin^2(\theta)$
- $\cos(2\theta) = 2\cos^2(\theta) - 1$
- $\cos(2\theta) = 1 - 2\sin^2(\theta)$

Equations

- Pour tout $(\theta, \theta') \in \mathbb{R}^2$,
$$\cos(\theta) = \cos(\theta') \iff \exists k \in \mathbb{Z} : \begin{cases} \theta = \theta' + 2k\pi \\ \text{ou} \\ \theta = -\theta' + 2k\pi \end{cases}$$
$$\sin(\theta) = \sin(\theta') \iff \exists k \in \mathbb{Z} : \begin{cases} \theta = \theta' + 2k\pi \\ \text{ou} \\ \theta = \pi - \theta' + 2k\pi \end{cases}$$
- Pour tout $(\theta, \theta') \in (D_{tan})^2$,
$$\tan(\theta) = \tan(\theta') \iff \exists k \in \mathbb{Z} : \quad \theta = \theta' + k\pi$$

Arctangente, arccosinus et arcsinus.

- Pour $x \in [-1, 1]$ et $\theta \in \mathbb{R}$,
$$\theta = \arcsin(x) \iff \theta \in [-\pi/2; \pi/2],\ \sin(\theta) = x$$
$$\theta = \arccos(x) \iff \theta \in [0; \pi],\ \cos(\theta) = x.$$
- Pour $x \in \mathbb{R}$ et $\theta \in \mathbb{R}$,
$$\theta = \arctan(x) \iff \theta \in]-\pi/2; \pi/2[,\ \tan(\theta) = x$$