Formulaire de trigonométrie pour futurs PTSI.

On écrit souvent $\cos x$ et $\sin x$ au lieu de $\cos(x)$ et $\sin(x)$, pour alléger.

Formule fondamentale

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

Formules d'addition

$$\cos(a+b) = \cos a \cos b - \sin a \sin b$$
$$\cos(a-b) = \cos a \cos b + \sin a \sin b$$
$$\sin(a+b) = \sin a \cos b + \cos a \sin b$$
$$\sin(a-b) = \sin a \cos b - \cos a \sin b$$

Formules de duplication

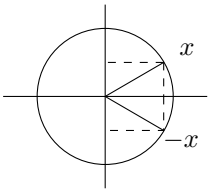
$$\begin{aligned}\cos(2x) &= (\cos x)^2 - (\sin x)^2 \\ &= 2(\cos x)^2 - 1 \\ &= 1 - 2(\sin x)^2 \\ \sin(2x) &= 2\sin x \cos x\end{aligned}$$

On en tire :

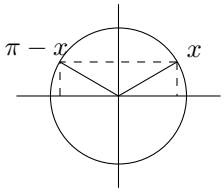
$$(\cos x)^2 = \frac{1+\cos(2x)}{2}$$
$$(\sin x)^2 = \frac{1-\cos(2x)}{2}$$

Transformations

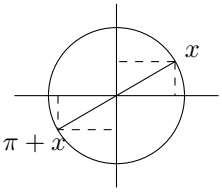
$$\cos(-x) = \cos(x)$$
$$\sin(-x) = -\sin(x)$$



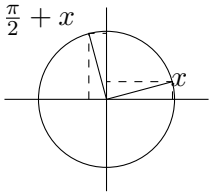
$$\cos(\pi - x) = -\cos(x)$$
$$\sin(\pi - x) = \sin(x)$$



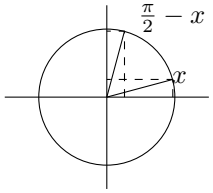
$$\cos(\pi + x) = -\cos(x)$$
$$\sin(\pi + x) = -\sin(x)$$



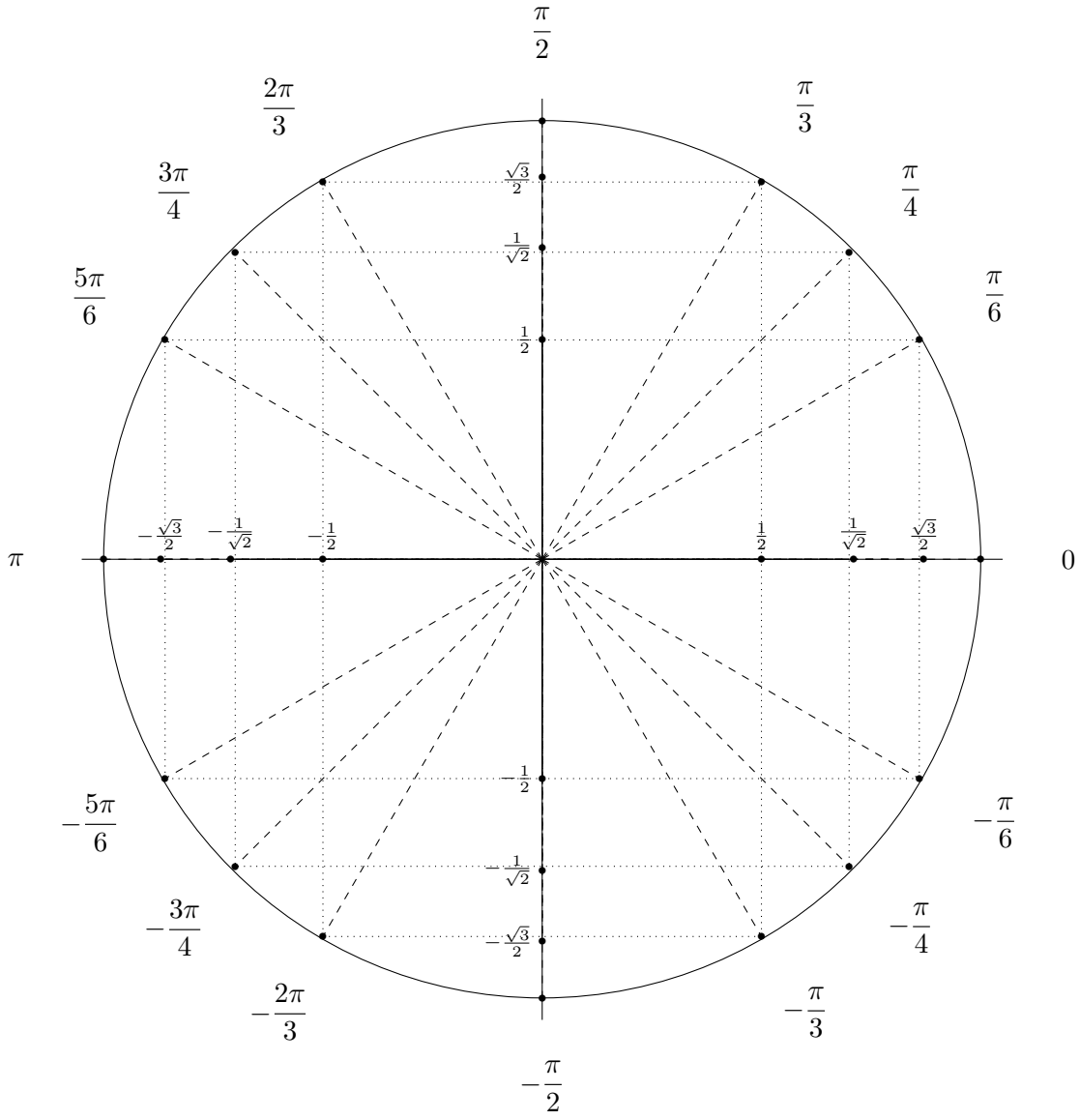
$$\cos(\tfrac{\pi}{2} + x) = -\sin(x)$$
$$\sin(\tfrac{\pi}{2} + x) = \cos(x)$$



$$\cos(\tfrac{\pi}{2} - x) = \sin(x)$$
$$\sin(\tfrac{\pi}{2} - x) = \cos(x)$$



Cercle trigonométrique



Formulaire pour futurs PTSI : dérivées usuelles.

Sous réserve de définition :

$F(x)$	$F'(x)$
C constante	0
x^a	ax^{a-1}
$\dfrac{1}{x}$	$-\dfrac{1}{x^2}$
$\sqrt{x}$	$\dfrac{1}{2\sqrt{x}}$
$\ln(x)$	$\dfrac{1}{x}$
$\exp(x)$	$\exp(x)$
$\sin(x)$	$\cos(x)$
$\cos(x)$	$-\sin(x)$
$\lambda u(x) + \mu v(x)$	$\lambda u'(x) + \mu v'(x)$
$u(x)v(x)$	$u'(x)v(x) + u(x)v'(x)$
$\dfrac{1}{u(x)}$	$-\dfrac{u'(x)}{(u(x))^2}$
$\dfrac{u(x)}{v(x)}$	$\dfrac{u'(x)v(x) - u(x)v'(x)}{(v(x))^2}$
$\sqrt{u(x)}$	$\dfrac{u'(x)}{2\sqrt{u(x)}}$
$(u(x))^a$	$au'(x)\,(u(x))^{a-1}$
$\exp(u(x))$	$u'(x)\exp(u(x))$
$\ln(u(x))$	$\dfrac{u'(x)}{u(x)}$
$g(f(x))$	$f'(x)\,g'(f(x))$