Formules de dérivation

Premières formules de dérivation	**1.** $\frac{d}{dx}(k) =$ *si* $k \in \mathbb{R}$	**2.** $\frac{d}{dx}(x) =$
	3. $\frac{d}{dx}(k \cdot f(x)) =$	**4.** $\frac{d}{dx}\big(f(x) + g(x)\big) =$
	5. $\frac{d}{dx}\big(f(x) - g(x)\big) =$	
	6. $\frac{d}{dx}\big(u(x) \cdot v(x)\big) =$	
	7. $\frac{d}{dx}\left(\dfrac{u(x)}{v(x)}\right) =$	
	8. $\frac{d}{dx}(x^n) =$ $(n \in \mathbb{R})$	**9.** $\frac{d}{dx}\big(f(x)\big)^n =$ $(n \in \mathbb{R})$
Fonctions exponentielles et logarithmiques	**11.** $\frac{d}{dx}e^{f(x)} =$	**12.** $\frac{d}{dx}b^{f(x)} =$
	13. $\frac{d}{dx}\log_b(f(x)) =$	**14.** $\frac{d}{dx}\ln(f(x)) =$
Fonctions trigonométriques et trigonométriques inverses	**15.** $\frac{d}{dx}\sin(f(x)) =$	**16.** $\frac{d}{dx}\cos(f(x)) =$
	17. $\frac{d}{dx}\tan(f(x)) =$	**18.** $\frac{d}{dx}\cotan(f(x)) =$
	19. $\frac{d}{dx}\sec(f(x)) =$	**20.** $\frac{d}{dx}\cosec(f(x)) =$
	21. $\frac{d}{dx}\arcsin(f(x)) =$	**22.** $\frac{d}{dx}\arccos(f(x)) =$
	23. $\frac{d}{dx}\arctan(f(x)) =$	**24.** $\frac{d}{dx}\arccotan(f(x)) = \dfrac{-1}{1+x^2}$
	25. $\frac{d}{dx}\arcsec(f(x)) = \dfrac{1}{|x|\sqrt{x^2-1}}$	**26.** $\frac{d}{dx}\arccosec(f(x)) = \dfrac{-1}{|x|\sqrt{x^2-1}}$

Remarque : Les formules 24, 25 et 26 ne font pas partie de la matière vue en Calcul I.

Les rapports trigonométriques
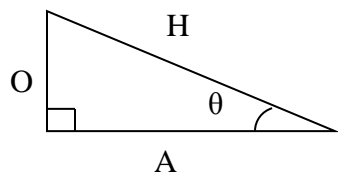
$$\sin\theta = \frac{O}{H} \qquad \cos\theta = \frac{A}{H}$$

$$\tan\theta = \frac{\sin\theta}{\cos\theta} = \frac{O}{A} \qquad \cotan\theta = \frac{1}{\tan\theta} = \frac{\cos\theta}{\sin\theta} = \frac{A}{O}$$

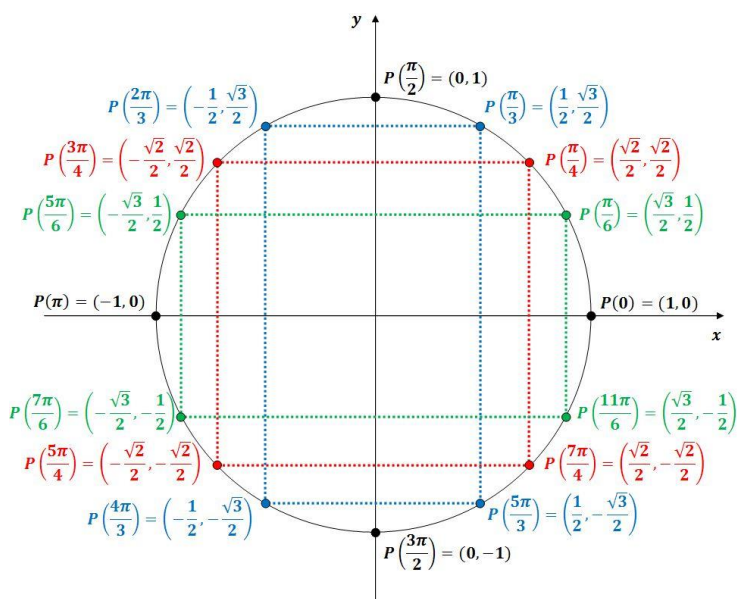$$\sec\theta = \frac{1}{\cos\theta} = \frac{H}{A} \qquad \cosec\theta = \frac{1}{\sin\theta} = \frac{H}{O}$$

Identités trigonométriques à retenir

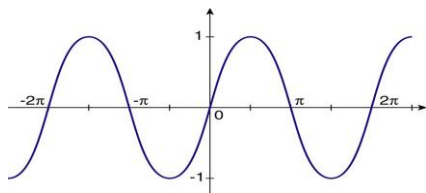1- $\sin^2\theta + \cos^2\theta = 1$

2- $\tan^2\theta + 1 = \sec^2\theta$

3- $\cotan^2\theta + 1 = \cosec^2\theta$

Cercle trigonométrique

$$P\left(\frac{\pi}{2}\right) = (0,1)$$
$$P\left(\frac{2\pi}{3}\right) = \left(-\frac{1}{2}, \frac{\sqrt{3}}{2}\right) \qquad P\left(\frac{\pi}{3}\right) = \left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$$
$$P\left(\frac{3\pi}{4}\right) = \left(-\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right) \qquad P\left(\frac{\pi}{4}\right) = \left(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right)$$
$$P\left(\frac{5\pi}{6}\right) = \left(-\frac{\sqrt{3}}{2}, \frac{1}{2}\right) \qquad P\left(\frac{\pi}{6}\right) = \left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$$
$$P(\pi) = (-1,0) \qquad P(0) = (1,0)$$
$$P\left(\frac{7\pi}{6}\right) = \left(-\frac{\sqrt{3}}{2}, -\frac{1}{2}\right) \qquad P\left(\frac{11\pi}{6}\right) = \left(\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$$
$$P\left(\frac{5\pi}{4}\right) = \left(-\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right) \qquad P\left(\frac{7\pi}{4}\right) = \left(\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right)$$
$$P\left(\frac{4\pi}{3}\right) = \left(-\frac{1}{2}, -\frac{\sqrt{3}}{2}\right) \qquad P\left(\frac{5\pi}{3}\right) = \left(\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$$
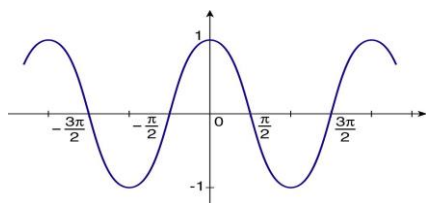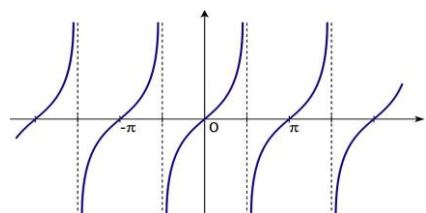$$P\left(\frac{3\pi}{2}\right) = (0,-1)$$
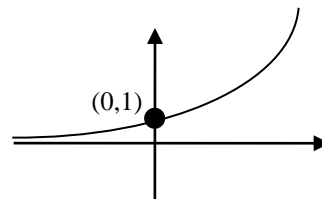
Quelques graphiques importants

$y = \sin x$

$y = \cos x$

$y = \tan x$

$y = e^x$

(0,1)

$y = \ln x$

(1,0)