

# FONCTIONS RECIPROQUES des FONCTIONS USUELLES

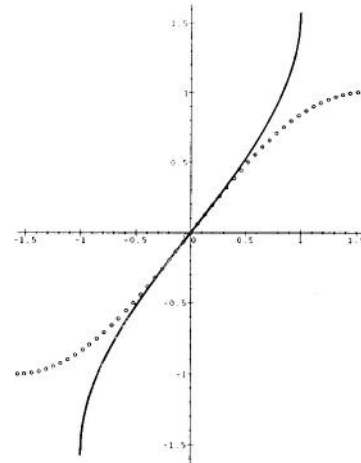
## Fonction Arcsin

$$\begin{cases} y = \text{Arcsin } x \\ x \in [-1, +1] \end{cases} \iff \begin{cases} x = \sin y \\ y \in \left[-\frac{\pi}{2}, +\frac{\pi}{2}\right] \end{cases}$$

fonction impaire

$$\begin{cases} \text{continue sur } [-1, +1] \\ \text{dérivable sur } ]-1, +1[ \end{cases}$$

$$[\text{Arcsin } x]' = \frac{1}{\sqrt{1-x^2}}$$



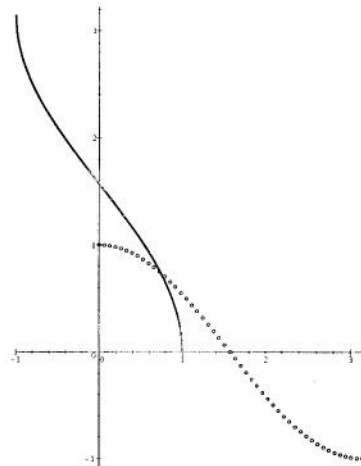
## Fonction Arccos

$$\begin{cases} y = \text{Arccos } x \\ x \in [-1, +1] \end{cases} \iff \begin{cases} x = \cos y \\ y \in [0, \pi] \end{cases}$$

fonction

$$\begin{cases} \text{continue sur } [-1, +1] \\ \text{dérivable sur } ]-1, +1[ \end{cases}$$

$$[\text{Arccos } x]' = \frac{-1}{\sqrt{1-x^2}}$$



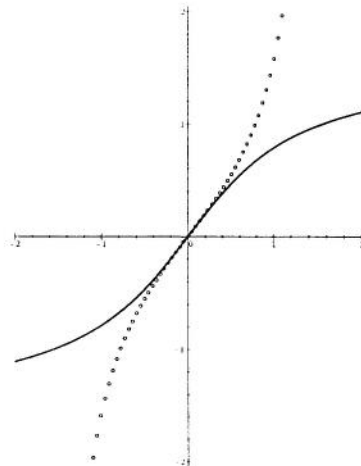
## Fonction Arctan

$$\begin{cases} y = \arctan x \\ x \in \mathbb{R} \end{cases} \iff \begin{cases} x = \tan y \\ y \in \left]-\frac{\pi}{2}, +\frac{\pi}{2}\right[ \end{cases}$$

fonction impaire

continue et dérivable sur  $\mathbb{R}$

$$[\text{Arctan } x]' = \frac{1}{1+x^2}$$



## relations importantes

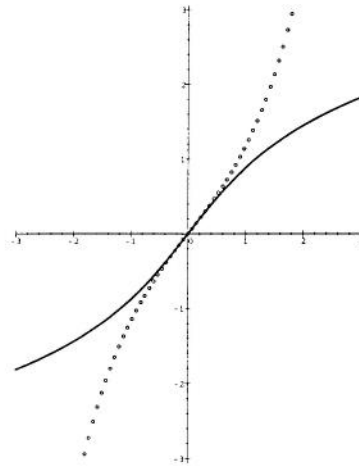
$$\text{Arcsin } x + \text{Arccos } x = \frac{\pi}{2} \quad \forall x \in [-1, +1] \quad \text{Arctan } x + \text{Arctan } \frac{1}{x} = \epsilon \frac{\pi}{2} \quad \text{avec } \epsilon x > 0$$

**Fonction Argsh**

$$\begin{cases} y = \text{Argsh}x \\ x \in \mathbb{R} \end{cases} \iff \begin{cases} x = \text{sh}y \\ y \in \mathbb{R} \end{cases}$$

fonction impaire  
continue et dérivable sur  $\mathbb{R}$

$$\begin{cases} [\text{Argsh}x]' = \frac{1}{\sqrt{1+x^2}} \\ \text{Argsh}x = \ln(x + \sqrt{1+x^2}) \end{cases}$$



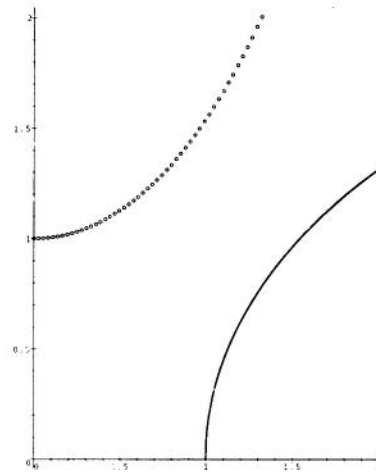
**Fonction Argch**

$$\begin{cases} y = \text{Argch}x \\ x \in [1, +\infty[ \end{cases} \iff \begin{cases} x = \text{ch}y \\ y \in [0, +\infty[ \end{cases}$$

fonction

$$\begin{cases} \text{continue sur } [1, +\infty[ \\ \text{dérivable sur } ]1, +\infty[ \end{cases}$$

$$\begin{cases} [\text{Argch}x]' = \frac{1}{\sqrt{x^2-1}} \\ \text{Argch}x = \ln(x + \sqrt{x^2-1}) \quad x > 1 \\ \text{Argch}(-x) = \ln(-x + \sqrt{x^2-1}) \quad x < -1 \end{cases}$$



**Fonction Argth**

$$\begin{cases} y = \text{Argth}x \\ x \in ]-1, +1[ \end{cases} \iff \begin{cases} x = \text{th}y \\ y \in \mathbb{R} \end{cases}$$

fonction impaire  
continue et dérivable sur  $] -1, +1[$

$$\begin{cases} [\text{Argth}x]' = \frac{1}{1-x^2} \\ \text{Argth}x = \frac{1}{2} \ln\left(\frac{1+x}{1-x}\right) \quad x \in ]-1, +1[ \\ \text{Argth}\frac{1}{x} = \frac{1}{2} \ln\left(\frac{x+1}{x-1}\right) \quad x < -1 \text{ ou } x > 1 \end{cases}$$

