

# Equivalents usuels

## Trigonométrie circulaire en 0

$$\begin{array}{l|l} \sin x \underset{x \rightarrow 0}{\sim} x & \tan x \underset{x \rightarrow 0}{\sim} x \\ \operatorname{Arcsin} x \underset{x \rightarrow 0}{\sim} x & \operatorname{Arctan} x \underset{x \rightarrow 0}{\sim} x \\ & 1 - \cos x \underset{x \rightarrow 0}{\sim} \frac{x^2}{2} \end{array}$$

## Trigonométrie hyperbolique en 0

$$\begin{array}{l|l} \operatorname{sh} x \underset{x \rightarrow 0}{\sim} x & \operatorname{th} x \underset{x \rightarrow 0}{\sim} x \\ \operatorname{argsh} x \underset{x \rightarrow 0}{\sim} x & \operatorname{argth} x \underset{x \rightarrow 0}{\sim} x \\ & \operatorname{ch} x - 1 \underset{x \rightarrow 0}{\sim} \frac{x^2}{2} \end{array}$$

## Exponentielle en 0

$$e^x - 1 \underset{x \rightarrow 0}{\sim} x$$

## Logarithme népérien en 1

$$\ln(1+x) \underset{x \rightarrow 0}{\sim} x \quad \text{ou encore} \quad \ln x \underset{x \rightarrow 1}{\sim} x - 1$$

## Arc cosinus et argument cosinus hyperbolique en 1

$$\operatorname{Arccos} x \underset{x \rightarrow 1}{\sim} \sqrt{2(1-x)} \quad \text{ou encore} \quad \operatorname{argch} x \underset{x \rightarrow 1}{\sim} \sqrt{2(x-1)}$$

## Fonctions puissances en 1

$$\text{Si } \alpha \neq 0, (1+x)^\alpha - 1 \underset{x \rightarrow 0}{\sim} \alpha x$$

## Trigonométrie hyperbolique en $+\infty$

$$\begin{array}{l} \operatorname{ch} x \underset{x \rightarrow +\infty}{\sim} \operatorname{sh} x \underset{x \rightarrow +\infty}{\sim} \frac{e^x}{2} \\ \operatorname{argch} x \underset{x \rightarrow +\infty}{\sim} \operatorname{argsh} x \underset{x \rightarrow +\infty}{\sim} \ln x \end{array}$$