

$$f(x) = \operatorname{Arctan} \left(\frac{1+x}{1-x} \right)$$

$$(a) \mathcal{D}_f = \mathbb{R} \setminus \{1\}$$

$$(b) f'(x) = \frac{1 \cdot (1-x) - (1+x)(-1)}{(1-x)^2} \cdot \frac{1}{1 + \left(\frac{1+x}{1-x} \right)^2}$$

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

$$= \frac{1}{1+x^2}$$

$$(c) \triangle \exists C_1, C_2 \in \mathbb{R} \quad f(x) = \begin{cases} \operatorname{Arctan} x + C_1 & x > 1 \\ \operatorname{Arctan} x + C_2 & x < 1 \end{cases}$$

$$\text{Avec } f(0) = \operatorname{Arctan} 1 = \frac{\pi}{4}, \quad C_2 = \frac{\pi}{4}$$

$$\text{Avec } f(x) \xrightarrow{+\infty} \operatorname{Arctan}(-1) = -\frac{\pi}{4}$$

$$\text{et} \quad \frac{\pi}{2} + C_1$$

$$\text{ou a} \quad C_1 = -\frac{3\pi}{4}$$