$$\sum_{n\geq 0} \frac{(-1)^{n+1}}{n!} (\log 10)^n = -\sum_{n\geq 0} \frac{(-\log 10)^n}{n!}$$

$$= -e^{-\log 10} = -e^{\log 1/10} = -\frac{1}{10}$$

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

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

$$(\cosh x - 1)\sin x = \frac{1}{2}x^3 + o(x^3)$$

Il limite cercato vale $2 \lim_{x\to 0^+} \dfrac{e^{-\operatorname{arctg} x} + \log\left(\frac{1+x}{e}\right)}{x^3} = +\infty$

$\text{dom} f = \mathbb{R} \setminus \{-1, 1/e\}$, $f \in \mathcal{C}(\text{dom}(f))$, $f(0) = f(\frac{2}{e-1}) = 0$

$\lim_{x \to -1} f(x) = -\infty$, $\lim_{x \to 1/e} f(x) = \infty$

$f'(x) = \log \frac{|1-ex|}{|x+1|} + \frac{x(e+1)}{(x+1)(ex-1)}$, $f'(\frac{2}{e-1}) = \frac{2(e-1)}{e+1} > 0$

$\exists$ max loc in $(-\infty, -1)$,

$\exists$ max loc in $(-1, 1/e)$

$f''(x) = \frac{(ex-x-2)(1+e)}{(ex-1)^2(x+1)^2}$

f concava in $(-\infty,-1)$, $(-1, 1/e)$, $(1/e, \frac{2}{e-1})$

f convessa in $[2/_{e-1}, +\infty)$

f strett. crescente in $(1/e, +\infty)$

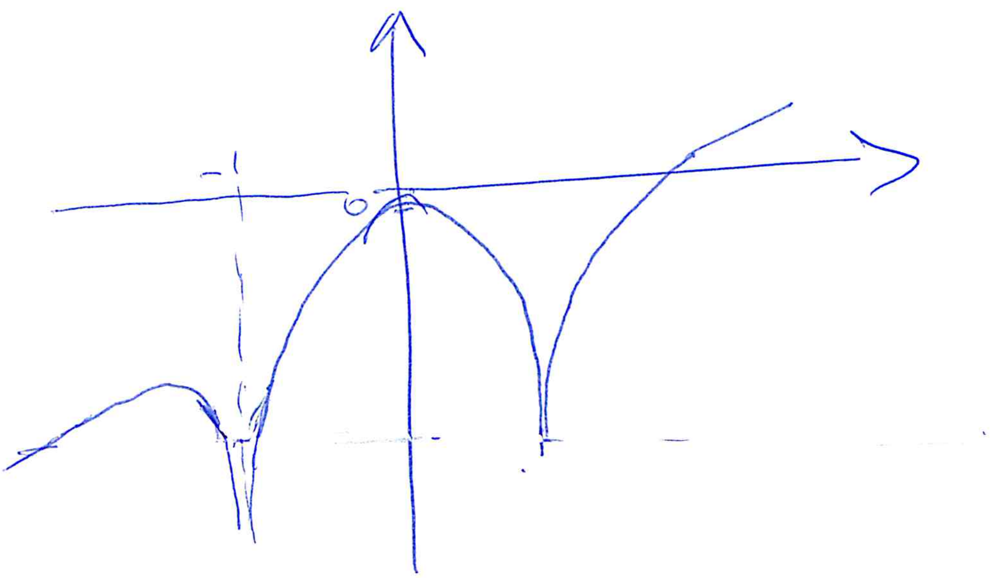
$$\lim_{x\to -\infty} \frac{f(x)}{x} = 1$$

$$\lim_{x\to +\infty} \frac{f(x)}{x} = 1$$

$$\lim_{x\to -\infty} f(x) - x = \lim_{t\to 0} \frac{1}{t}\left(\log \frac{e-t}{1+t} - 1\right) = -1 - 1/e$$

$$\lim_{x\to +\infty} f(x) - x = -1 - 1/e$$

$\{ y = x - 1 - 1/e \}$ asintoto obliquo a + e −∞



Cambio di variabile

$$\varphi(t) = \sin t \qquad t \in \left[-\pi/2 \,,\, \pi/2\right]$$

$$\int \dots = \int \frac{(\sin t)^3}{\sqrt{1-(\sin t)^2}} \cos t \; dt \;\Big|_{t = \arcsin x}$$

$$= \int (\sin t)^3 \, dt \;\Big|_{t = \arcsin x}$$

$$\int (\sin t)^3 \, dt = \int \sin t \, dt - \int (\cos t)^2 \sin t \, dt$$

$$= -\cos t - \int (\cos t)^2 \sin t \, dt$$

$$= -\cos t + \frac{(\cos t)^3}{3} + c$$

$$\int \dots = \left[-\cos t + \frac{(\cos t)^3}{3} + c \right]_{t = \arcsin x}$$

$$= \frac{1}{3}(1-x^2)^{3/2} - \sqrt{1-x^2} + c$$