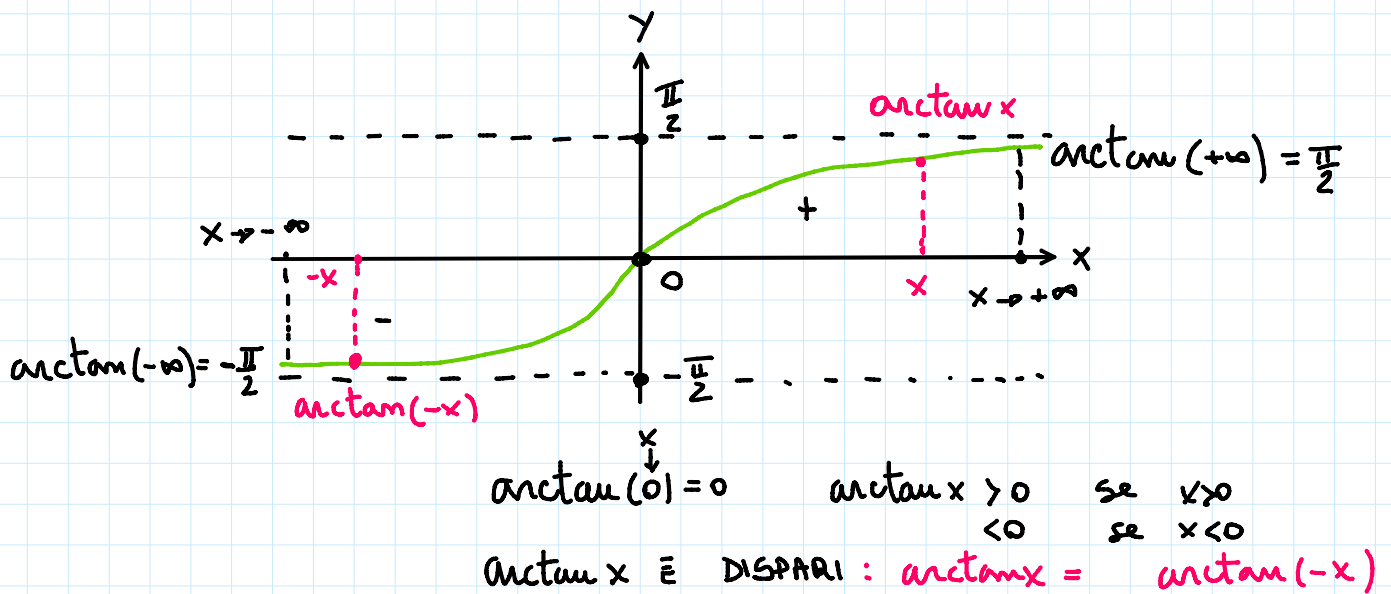


GRAFICO ARCOTANGENTE $f(x) = \arctan x$



APPELLO 22.01.2025

$$f(x) = \arctan\left(\frac{2x}{x^2-1}\right)$$

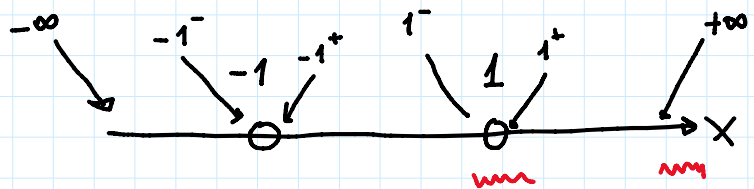
1) DOMINIO

$$x^2 - 1 \neq 0$$

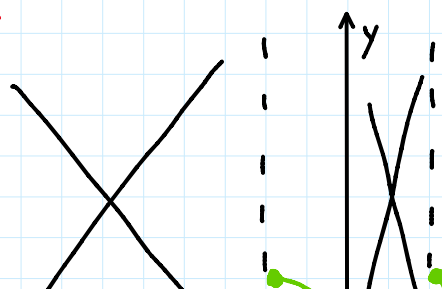
$$x \neq \pm 1$$

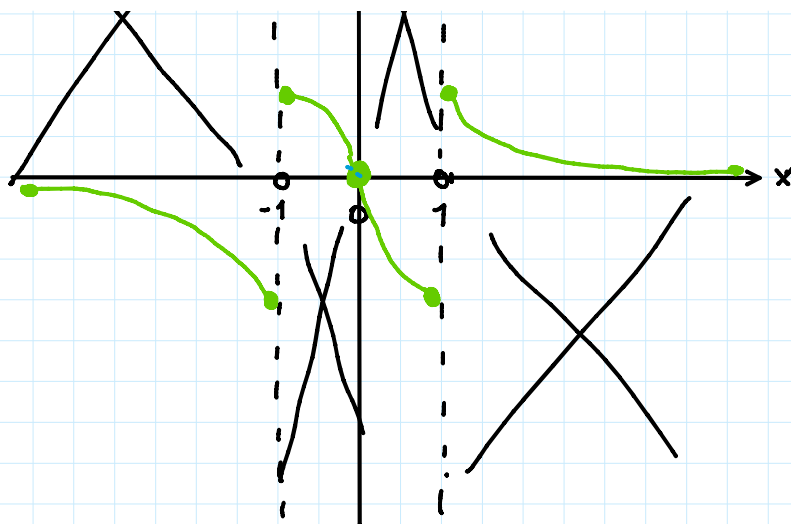
$$x \neq \pm 1$$

"DISEGNO"



"DISEGNO È"





2) PARI E DISPARI

$$f(x) = \arctan\left(\frac{2x}{x^2-1}\right)$$

DISPARI

$$f(-x) = \arctan\left(\frac{2(-x)}{(-x)^2-1}\right) = \arctan\left(-\frac{2x}{x^2-1}\right)$$

$f(x)$ È DISPARI

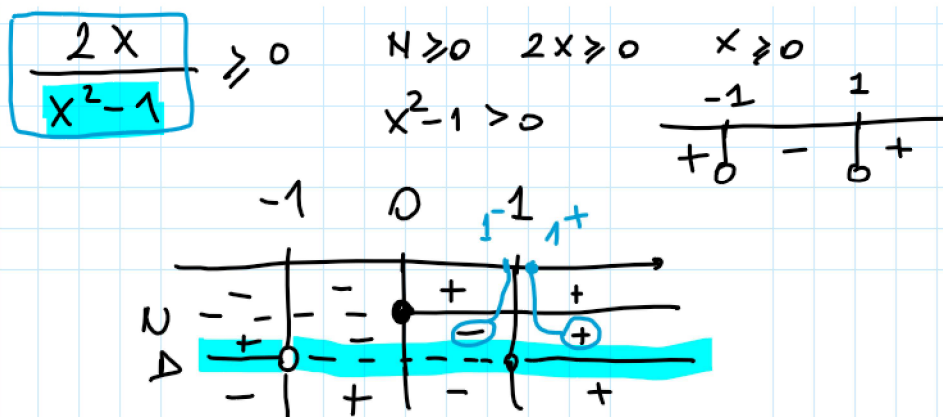
3) INTERSEZIONE ASSI

$$\begin{cases} x=0 & \text{CONTROLLA SEMPRE SE O E D; ALTRIMENTI NON SI FA} \\ y = \arctan\left(\frac{2(0)}{-1}\right) = \arctan 0 = 0 & o(0;0) \end{cases}$$

$$\begin{cases} y=0 \\ \arctan\left(\frac{2x}{x^2-1}\right) = 0 \Rightarrow x=0 \end{cases}$$

4) STUDIO DEL SEGNO

$$f(x) > 0 \Rightarrow \arctan\left(\frac{2x}{x^2-1}\right) > 0$$



5) ASINTOTTI

SICCOME $f(x)$ È DISPARI FACCIO $x \rightarrow 1$
 $x \rightarrow +\infty$

È IN AUTOMATICO HO $x \rightarrow -1$
 $x \rightarrow -\infty$

VERTICALE

$$\lim_{x \rightarrow 1^+} \arctan\left(\frac{2x}{x^2-1}\right) = \arctan \frac{2}{1-1} = \arctan \frac{2}{0}$$

CONTA $x \rightarrow 1^+$
 $\frac{0^+}{0^+}$?

$$\lim_{x \rightarrow 1^-} \arctan\left(\frac{2x}{x^2-1}\right) = \arctan(-\infty) = -\frac{\pi}{2}$$

$$= \arctan \frac{2}{0^-}$$

$$\arctan \frac{2}{0^+} = \arctan(+\infty) = \frac{\pi}{2}$$

$$\lim_{x \rightarrow -1^+} f(x) = \frac{\pi}{2}$$

$$\lim_{x \rightarrow -1^-} f(x) = -\frac{\pi}{2} \quad (\text{DISPARI})$$

ORIZZONTALE

$$\lim_{x \rightarrow +\infty} \arctan\left(\frac{2x}{x^2-1}\right) \sim \lim_{x \rightarrow +\infty} \arctan\left(\frac{2x}{x^2}\right)$$

$$\arctan 0 = 0$$

$$\lim_{x \rightarrow -\infty} \arctan\left(\frac{2x}{x^2-1}\right) = 0$$

$$y = 0$$

ASINTOTO
ORIZZONTALE