ANALYSE : Fonctions cyclométriques

Etudes de fonctions (énoncés du syllabus)

$f(x) = arctg\,\frac{1}{2-x}$

D=R/{2} $I =]-\frac{\pi}{2}, \frac{\pi}{2}[$

Inters. avec OY (0 ;arctg0,5)
Inters. avec OX /

x		2	
f(x)	+	/	-

ni pair, ni impair

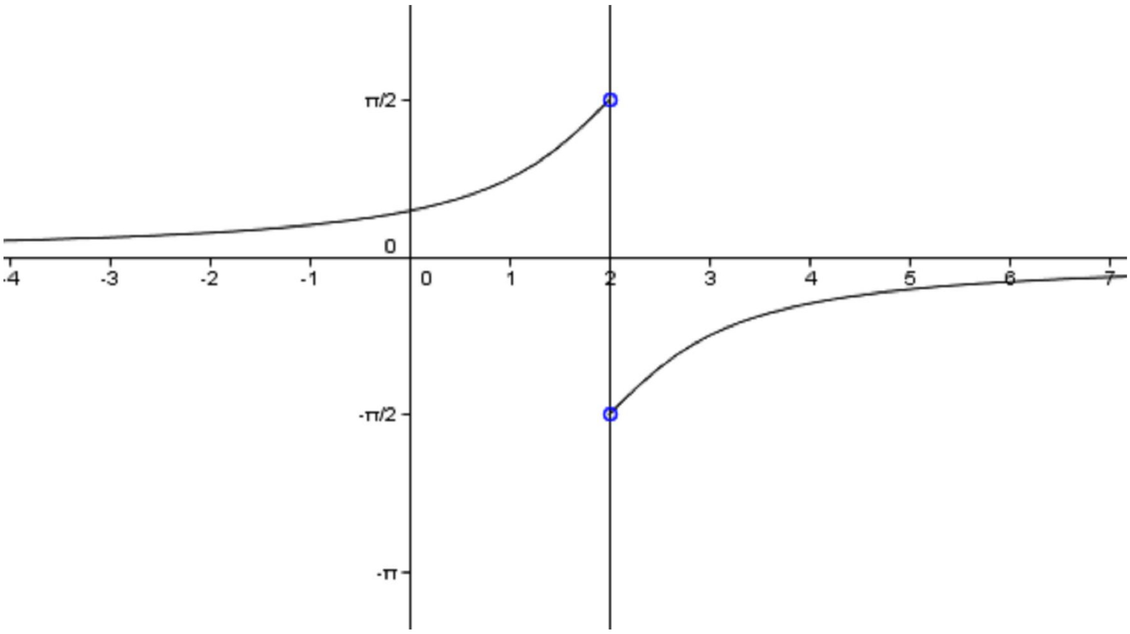
$\lim_{x\to 2\pm} f(x) = \mp\frac{\pi}{2}$

$\lim_{x\to\pm\infty} f(x) = 0^{\mp} \quad A.H. \equiv y = 0$

$f'(x) = \frac{1}{1+\left(\frac{1}{2-x}\right)^2}\frac{-(-1)}{(2-x)^2} = \frac{1}{x^2-4x+5} > 0$

$f''(x) = \frac{-(2x-4)}{(x^2-4x+5)^2}$

x		2	
f''(x)	+	/	-



©A.Vanlook

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

D=R/{-1,1} $I =]-\frac{\pi}{2}, \frac{\pi}{2}[$

Inters. avec OY (0 ;0)
Inters. avec OX (0 ;0)
impair

x			-1		0		1	
f(x)	+	+	/	-	0	+	/	-

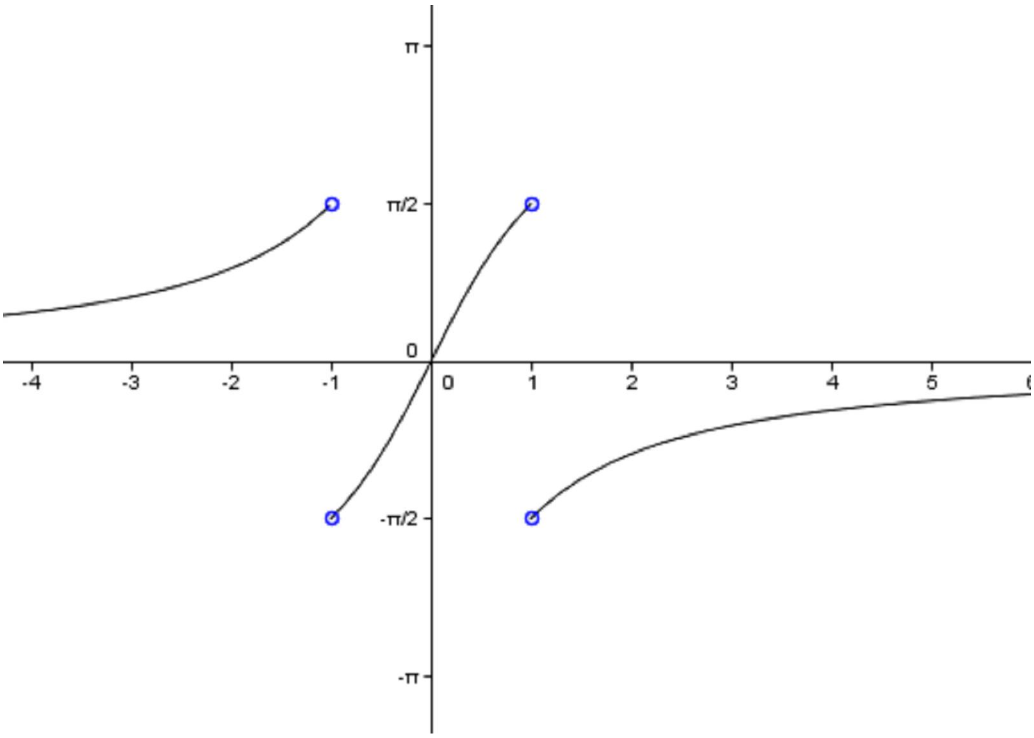
$\lim_{x\to 1\pm} f(x) = \mp \frac{\pi}{2}$

$\lim_{x\to +\infty} f(x) = 0^- \quad A.H. \equiv y = 0$

$f'(x) = \frac{1}{1+\left(\frac{2x}{1-x^2}\right)^2} \frac{2(1-x^2)-2x.(-2x)}{(1-x^2)^2} = \frac{2(x^2+1)}{x^4+2x^2+1} = \frac{2}{x^2+1} > 0$

$f''(x) = \frac{-4x}{(x^2+1)^2}$

x		0	
f''(x)	+	/	-



f(x)=x – arctan(x)

D = R I = R
Inters. avec OY (0 ;0)
Inters. avec OX (0 ;0)
impair

x		0	
f(x)	-	0	+

$$\lim_{x\to+\infty} f(x) = "+\infty - \frac{\pi}{2}" = +\infty$$

$$\lim_{x\to+\infty} \frac{f(x)}{x} = \lim_{x\to+\infty} 1 - \frac{\arctan(x)}{x} = 1 - \lim_{x\to+\infty} \frac{1}{1+x^2} = 1$$

$$\lim_{x\to+\infty} (x - \arctan(x) - x) = \lim_{x\to+\infty} (-\arctan(x) = -\frac{\pi}{2}$$

$$A.O. \equiv y = x - \frac{\pi}{2} en + \infty$$

$$A.O. \equiv y = x + \frac{\pi}{2} en - \infty$$

$$f'(x) = 1 - \frac{1}{1+x^2} = \frac{x^2}{1+x^2} > 0$$

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

x		0	
f''(x)	-	PI	+

$t_{PI} \equiv y = 0$