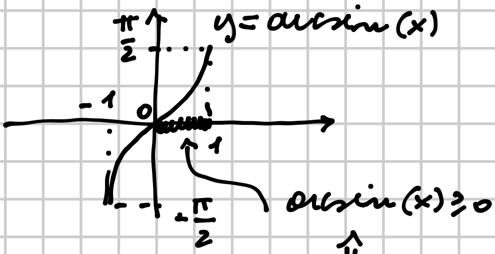
Trovare il dominio della funzione: 6/10/2022

543 $y = \sqrt{\arcsin(x-1)}$ $[[1; 2]]$



$$\Updownarrow$$

$0 \leq x \leq 1$

dom $\arcsin x = [-1, 1]$ dom $\sqrt{x} = [0, +\infty)$

$$\begin{cases} \arcsin(x-1) \geq 0 \\ -1 \leq x-1 \leq 1 \end{cases} \quad \begin{cases} 0 \leq x-1 \leq 1 \\ -1 \leq x-1 \leq 1 \end{cases} \Rightarrow 0 \leq x-1 \leq 1$$

$$\Downarrow$$

$$1 \leq x \leq 2$$

dom $= [1, 2]$

Trovare il dominio

544 $y = \arctan \frac{x+1}{1-x}$ $[\mathbb{R} - \{1\}]$

dom arctan $= \mathbb{R}$

$\frac{x+1}{1-x}$ può assumere qualsiasi valore (purché esista!)

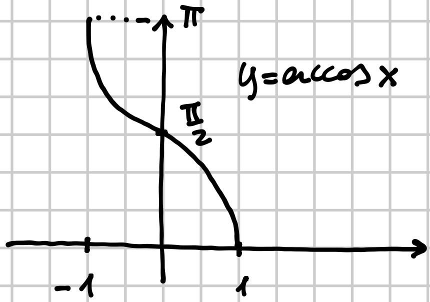
$$\Downarrow$$

$1 - x \neq 0$ cioè $x \neq 1$

dom $= \mathbb{R} \setminus \{1\} = (-\infty, 1) \cup (1, +\infty)$

Trovare il dominio:

540 $y = \arccos \frac{x-1}{x+3}$ $[[-1; +\infty[]$



$$-1 \leq \frac{x-1}{x+3} \leq 1$$

$$\begin{cases} \frac{x-1}{x+3} \leq 1 \\ \frac{x-1}{x+3} \geq -1 \end{cases} \quad \begin{cases} \frac{x-1}{x+3} - 1 \leq 0 \\ \frac{x-1}{x+3} + 1 \geq 0 \end{cases}$$

$$\begin{cases} \dfrac{x-1}{x+3} - 1 \leq 0 \\[2ex] \dfrac{x-1}{x+3} + 1 \geq 0 \end{cases} \qquad \begin{cases} \dfrac{\cancel{x}-1-\cancel{x}-3}{x+3} \leq 0 \\[2ex] \dfrac{x-1+x+3}{x+3} \geq 0 \end{cases} \qquad \begin{cases} \dfrac{-4}{x+3} \leq 0 \\[2ex] \dfrac{2x+2}{x+3} \geq 0 \end{cases}$$

$$\begin{cases} \dfrac{4}{x+3} \geq 0 \\[2ex] \dfrac{\cancel{2}(x+1)}{x+3} \geq 0 \end{cases} \qquad \begin{cases} x+3 > 0 \\[2ex] x+1 \geq 0 \end{cases} \qquad \begin{cases} x > -3 \\[2ex] x \geq -1 \end{cases} \Rightarrow x \geq -1$$

perché la 1ª disequazione
mi dice che il denominatore è > 0

$$dom = [-1, +\infty)$$

Calcolare il valore:

189 $\cos\left(arc\,sen\,\dfrac{5}{13}\right)$ $\left[\dfrac{12}{13}\right]$

Dato che $0 \leq \dfrac{5}{13} \leq 1$, si ha che $0 \leq \arcsin\dfrac{5}{13} \leq \dfrac{\pi}{2}$, quindi

$\cos\left(\arcsin\dfrac{5}{13}\right) \geq 0 \Rightarrow$ SEGNO +

$$\cos\alpha = \pm\sqrt{1-\sin^2\alpha}$$

$$\cos\left(\arcsin\frac{5}{13}\right) = +\sqrt{1-\sin^2\left(\arcsin\frac{5}{13}\right)} = \sqrt{1-\left(\frac{5}{13}\right)^2} =$$

$$= \sqrt{\frac{169-25}{169}} = \sqrt{\frac{144}{169}} = \frac{12}{13}$$

191 $sen\left(arc\cos\frac{7}{25}\right) =$ $\left[\frac{24}{25}\right]$

SEGNO + perché arccos(x) è sempre compreso fra 0 e π.

$$= +\sqrt{1-\cos^2\left(\arccos\frac{7}{25}\right)} = \sqrt{1-\left(\frac{7}{25}\right)^2} =$$

$$= \sqrt{\frac{625-49}{625}} = \sqrt{\frac{576}{625}} = \frac{24}{25}$$

195 $tan\left(arc\cos\frac{1}{3}\right) =$ $[2\sqrt{2}]$

$$= \frac{\sin\left(\arccos\frac{1}{3}\right)}{\cos\left(\arccos\frac{1}{3}\right)} = \frac{\sqrt{1-\cos^2\left(\arccos\frac{1}{3}\right)}}{\frac{1}{3}} = \frac{\sqrt{1-\left(\frac{1}{3}\right)^2}}{\frac{1}{3}} =$$

$$= \frac{\sqrt{1-\frac{1}{9}}}{\frac{1}{3}} = \frac{\sqrt{\frac{8}{9}}}{\frac{1}{3}} = \frac{\frac{2}{\cancel{3}}\sqrt{2}}{\frac{1}{\cancel{3}}} = 2\sqrt{2}$$

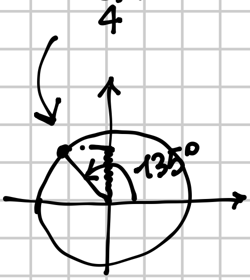
ATTENZIONE!

$$\sin(\arcsin x) = x \quad \forall x \in [-1, 1]$$

$$\arcsin(\sin x) = x \quad \forall x \in \left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$$

Se x non è nell'intervallo $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$, la seconda formula **NON** vale. Ad es.

$x = \frac{3}{4}\pi$ $\quad \arcsin\left(\underbrace{\sin\frac{3}{4}\pi}\right) = \arcsin\left(\frac{\sqrt{2}}{2}\right) = \underbrace{\frac{\pi}{4}}$



DIVERSI

38 $\dfrac{\cos(5\pi+\alpha)\sin\left(\frac{3}{2}\pi+\alpha\right)+\tan(-\alpha)\sin\left(\alpha-\frac{5}{2}\pi\right)+\sin^2(3\pi+\alpha)}{\cos(\alpha-6\pi)\sin(2\pi-\alpha)-\cos\left(\frac{7}{2}\pi-\alpha\right)} =$ $\left[\dfrac{1+\sin\alpha}{\sin\alpha(1-\cos\alpha)}\right]$

$$= \frac{\cos(\cancel{4\pi}+\pi+\alpha)\sin\left(\cancel{2\pi}-\frac{\pi}{2}+\alpha\right)-\tan\alpha\sin\left(\alpha-\frac{\pi}{2}-\cancel{2\pi}\right)+\sin^2(\cancel{2\pi}+\pi+\alpha)}{\cos\alpha\cdot\sin(-\alpha)-\cos\left(\cancel{4\pi}-\frac{\pi}{2}-\alpha\right)} =$$

$$[-\sin\alpha]^2$$

$$= \frac{-\cos\alpha\left[-\sin\left(\frac{\pi}{2}-\alpha\right)\right]-\tan\alpha\left[-\sin\left(\frac{\pi}{2}-\alpha\right)\right]+\sin^2\alpha}{\cos\alpha\cdot(-\sin\alpha)-\cos\left(\frac{\pi}{2}+\alpha\right)} =$$

$$= \frac{-\cos\alpha(-\cos\alpha)-\tan\alpha[-\cos\alpha]+\sin^2\alpha}{-\cos\alpha\sin\alpha+\sin\alpha}$$