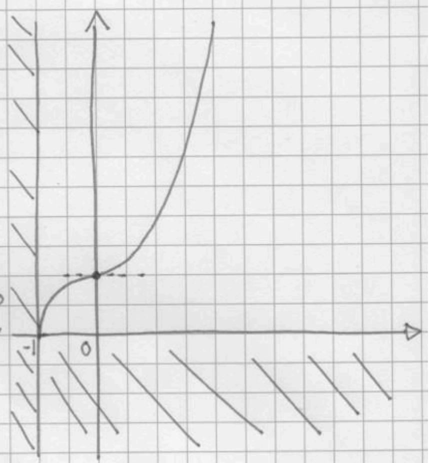
$y = \sqrt{x^3+1}$ $\mathcal{D}: \; x^3+1 \geq 0 \quad x^3 \geq -1 \quad x \geq -1$

segno $y \geq 0 \quad \forall x \in \mathcal{D}$

$f(-1) = 0 \quad f(0) = 1$

fz. né pari né d.



LIMITI AI BORDI DEL DOMINIO

$$\lim_{x \to +\infty} \sqrt{x^3+1} = +\infty$$

MAX MIN FL

$$y' = \frac{3x^2}{2\sqrt{x^3+1}} \qquad y' = 0 \quad x = 0$$

dunque $x = 0$ flesso ascendente

$y' > 0 \quad \forall x \in \mathcal{D}$ fz. sempre crescente

dominio y' : lo stesso di y tranne il punto -1

studio la derivata in un intorno ds di -1

$$\lim_{x \to -1^+} \frac{3x^2}{2\sqrt{x^3+1}} = \frac{3}{0} = \infty$$ $x = -1$ punto a tg verticale

$$y'' = \frac{6x \cdot 2\sqrt{x^3+1} - 3x^2 \cdot \cancel{2} \cdot \frac{1}{\cancel{2}\sqrt{x^3+1}} \cdot 3x^2}{4(x^3+1)} = \frac{\frac{12x(x^3+1) - 9x^4}{\sqrt{x^3+1}}}{4(x^3+1)} =$$

$$= \frac{12x^4 + 12x - 9x^4}{4(x^3+1)\sqrt{x^3+1}} = \frac{3x^4 + 12x}{4(x^3+1)\sqrt{x^3+1}}$$

$$y'' = 0 \quad 3x^4 + 12x = 0 \quad 3x(x^3+4) = 0 \quad < \begin{array}{l} x = 0 \\ x = -\sqrt[3]{4} \end{array}$$

$y'' > 0 \quad 3x > 0 \quad x > 0$

$x^3 + 4 > 0 \quad x > -\sqrt[3]{4}$ dunque $\forall x \in \mathcal{D}$ poiché $-\sqrt[3]{4} < -1$

$4(x^3+1)\sqrt{x^3+1} > 0 \quad \forall x \in \mathcal{D}$