

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

Ris

$A = \mathbb{R}$

segno $f(x) = -\frac{(x+1)}{x^2+1} \geq 0$ sse $x \leq -1$

$f(x) > 0$ sse $x < -1$

$f(x) = 0$ $x = -1$

$f(x) < 0$ $x > -1$

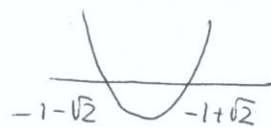
intersezione assi $(-1, 0), (0, -1)$

$f \in C^1(\mathbb{R})$

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

$f'(x) \geq 0$ sse $x^2+2x-1 \geq 0$

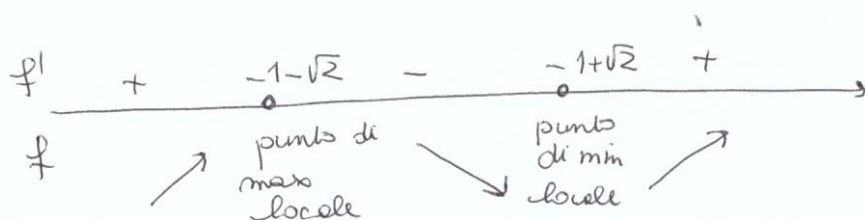
$f'(x) = 0$ sse $x = \frac{-2 \pm \sqrt{4+4}}{2} = \frac{-2 \pm 2\sqrt{2}}{2} = -1 \pm \sqrt{2}$



quindi $f'(x) > 0$ sse $x < -1 - \sqrt{2} \cup x > -1 + \sqrt{2}$

$f'(x) = 0$ sse $x = -1 \pm \sqrt{2}$

$f'(x) < 0$ sse $-1 - \sqrt{2} < x < -1 + \sqrt{2}$



$f(-1 - \sqrt{2}) = \frac{\sqrt{2}}{4 + 2\sqrt{2}}$

$f(-1 + \sqrt{2}) = -\frac{\sqrt{2}}{4 - 2\sqrt{2}}$

$f''(x) = \frac{(2x+2)(x^2+1)^2 - (x^2+2x-1)2(x^2+1)2x}{(x^2+1)^4} = \frac{-2(x^3+3x^2-3x-1)}{(x^2+1)^3}$

$= \frac{-2(x-1)(x^2+4x+1)}{(x^2+1)^3}$

$f''(x) > 0$ sse $x < -2 - \sqrt{3} \cup -2 + \sqrt{3} < x < 1$

raccolgo (x^2+1)

	$-2 - \sqrt{3}$	$-2 + \sqrt{3}$	1	
$-2(x-1)$	+	+	+	-
x^2+4x+1	+	0	-	+
$(x^2+1)^3$	+	+	+	+
$f''(x)$	+	-	+	-