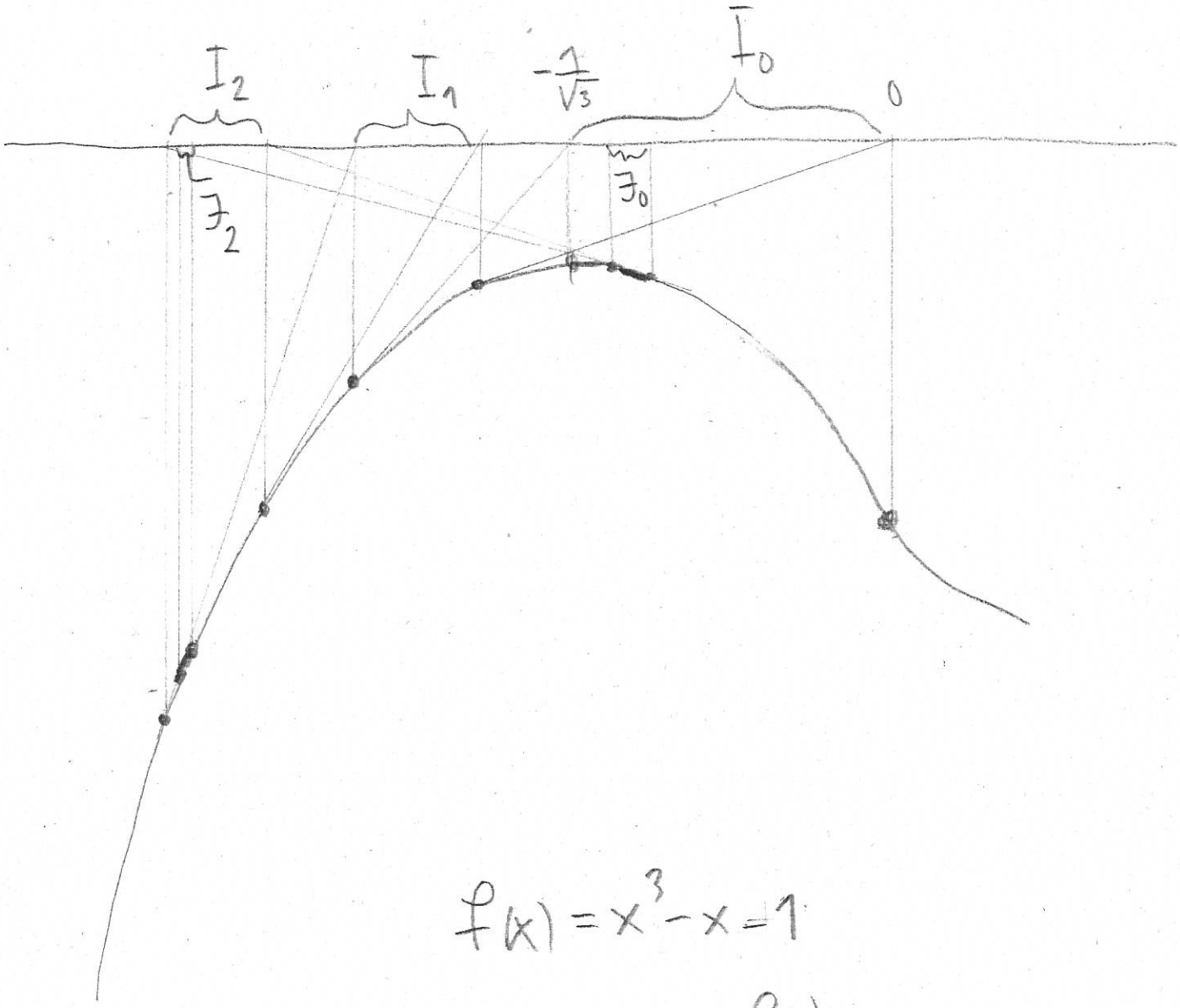


$$f(x) = x^3 - x - 1$$

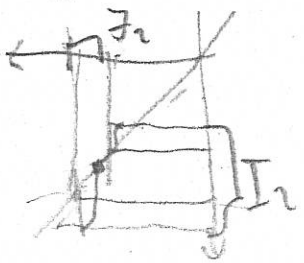
$$N(x) = x - \frac{f(x)}{f'(x)} \quad \text{Newton-iterate}$$

$$I_0 = \left[-\frac{1}{\sqrt{3}}, 1\right]$$

$$N : I_{-2} \leftrightarrow I_{-1} \leftrightarrow I_0 \leftrightarrow [-\infty, -1]$$

$$J_0 := N^{-1}(I_2) \qquad J_2 := N^{-2}(J_0)$$

$$N^3 : J_2 \leftrightarrow I_2$$



3-FIXPUNT $\quad \exists x_2 \in J_2 \quad N^3(x_2) = x_2$

$I_0 = \left(-\frac{1}{\sqrt{3}}, 0\right)$ $\quad I_1 = N^{-1}(I_0) = \left[-\frac{\sqrt{3}}{2}, -\frac{1}{352\sqrt{3}}\right]$ (1,0)

$I_2 = N^{-1}(I_1) = [-1.19856, -0.544525]$

$\mathrm{Root}(78x^6 - 81x^4 + 18x^2 - 1)$

$\mathrm{Root}(6912x^{18} - 19553x^{12} + 2786x^{10} - 1823x^8 + 5112x^6 - 851x^4 + 54x^2 - 1)$

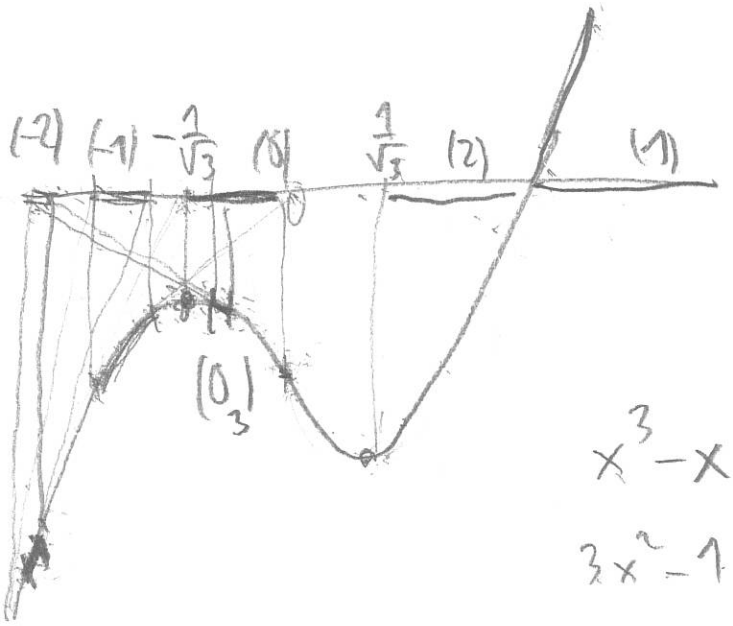
$J_0 = N^{-1}(I_2)$ jobbrol $= [-0.956726, -0.331702]$

$J_1 = N^{-1}(J_0)$ ~~balra~~ $= [-0.800755, -0.770288]$

$J_2 = N^{-1}(J_1) = [-1.11056, -1.07139]$

$X_* = -1.09751$ 3-ADIKUS FIXPONT

$N^3 : J_2 \nearrow I_2$



$$x^3 - x + \tfrac{2}{\sqrt{3}} = f(x)$$

$$3x^2 - 1 = f'(x)$$

$$N(x) := x - \frac{f(x)}{f'(x)}$$

$x_0 \in (-2)$

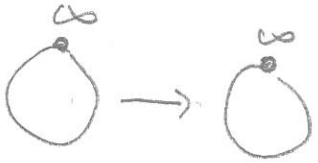
$x_1 \in (-1)$

$x_2 \in (0)$

$N: (1) \to (1)$ ⇝ Root

$(2) \to (1)$ ⇝ Root

$N: (-2) \overset{N}{\leftrightarrow} (-1) \overset{N}{\leftrightarrow} (0) \overset{N}{\leftrightarrow} (-\infty, -\frac{1}{\sqrt{3}})$

$N:$ 

Fixpt

$0_3 := N^{-1}(-2)$

$|x| \to \infty \quad |N(x)| = \left| \frac{x(3x^2-1) - x^3 + x + 3}{3x^2 - 1} \right|$

$= \left| \frac{2x^3 + 3}{3x^2 - 1} \right| \to \infty$

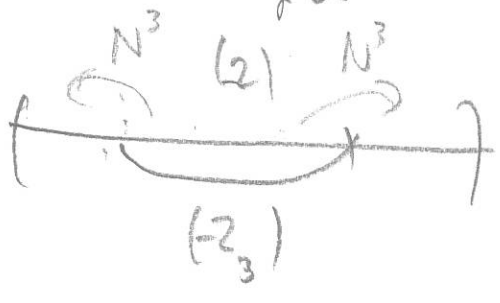
$N^2: (-2) \leftrightarrow (0)$

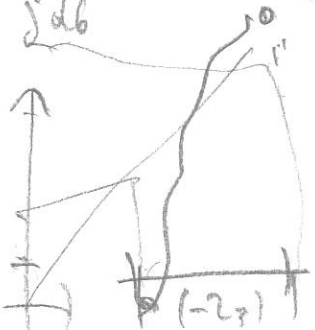
$(-2_3) := N^{-2}(0_3)$

$N^3: (-2_3) \Rightarrow N^{-2}(0_3) \leftrightarrow N^3 N^{-2}(0_3) = N(0_3) = (-2)$

$N^2: (-2_3)$ bijektiv $\to (0_3)$ bijektiv

$N^3: (-2_3)$ bijektiv $\to (-2)$ bijektiv





$\exists x_* \in (-2_3) \; N^3(x_*) = x_*$

$N^3(x_*) = x_*$