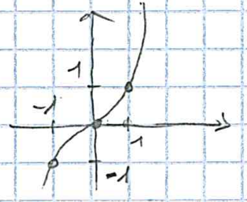
Rappresentare le seguenti funzioni usando le trasformazioni grafiche

$g(x) = |2 - x^3| \rightarrow g(x) = |-x^3+2|$

Sol: $D_g = \mathbb{R}$

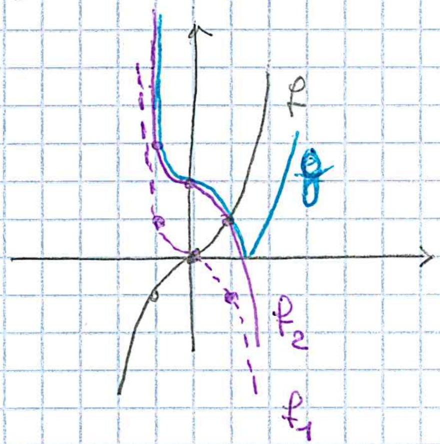
$f(x) = x^3 \longrightarrow$



$f_1(x) = -f(x) = -x^3$

$f_2(x) = f_1(x) + 2 = -x^3+2$

$f_3(x) = |f_2(x)| = |-x^3+2| = g(x)$



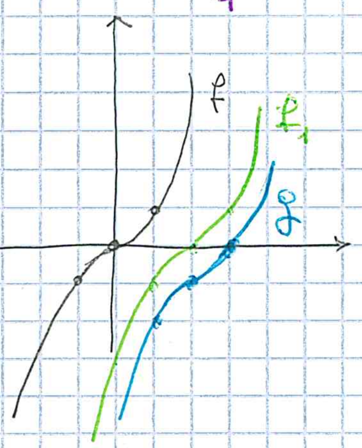
$g(x) = (x-2)^3 - 1$

Sol $D_g = \mathbb{R}$

$f(x) = x^3$

$f_1(x) = f(x-2) = (x-2)^3$

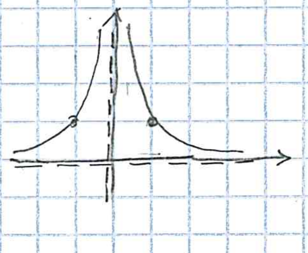
$f_2(x) = f_1(x) - 1 = (x-2)^3 - 1 = g(x)$



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

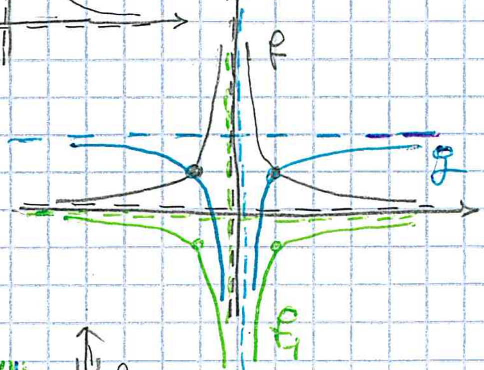
Sol D_g: $x \neq 0$

$f(x) = \frac{1}{x^4} = x^{-4} \longrightarrow$



$f_1(x) = -f(x) = -\frac{1}{x^4}$

$f_2(x) = f_1(x) + 2 = -\frac{1}{x^4} + 2 = g(x)$



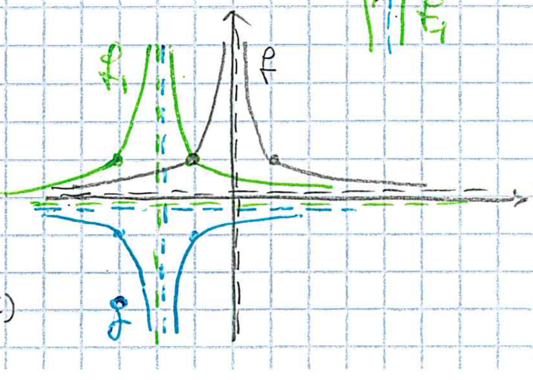
$g(x) = -\frac{1}{(x+2)^4}$

Sol: D_g: $x+2 \neq 0 \quad x \neq -2$

$f(x) = \frac{1}{x^4} = x^{-4}$ come sopra

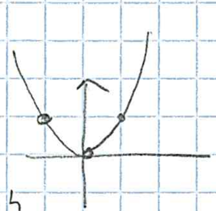
$f_1(x) = f(x+2) = \frac{1}{(x+2)^4}$

$f_2(x) = -f_1(x) = \frac{-1}{(x+2)^4} = g(x)$



$g(x) = -(x-3)^4 + 2$

Sol: $D_g = \mathbb{R}$

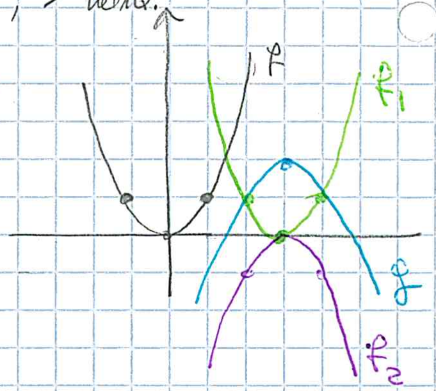
$f(x) = x^4 \Rightarrow$ 

$D_f = \mathbb{R}$, $\nearrow$ nel 1Q.
PARI

$f_1(x) = f(x-3) = (x-3)^4$

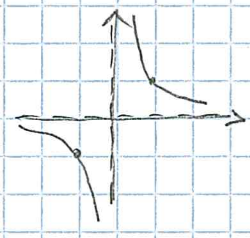
$f_2(x) = -f_1(x) = -(x-3)^4$

$f_3(x) = f_2(x) + 2 = -(x-3)^4 + 2 = g(x)$



$g(x) = \dfrac{1}{|x|^5} - 2$

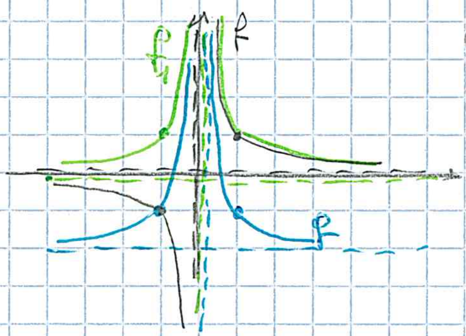
Sol: $D_g: x \neq 0$

$f(x) = \dfrac{1}{x^5} = x^{-5} \Rightarrow$ 

$D_f: \mathbb{R}$, $\searrow$ nel 1°Q.
DISPARI

$f_1(x) = f(|x|) = \dfrac{1}{|x|^5}$

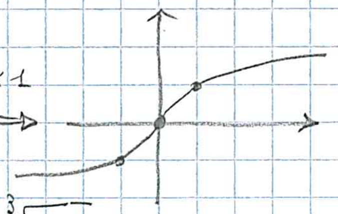
$f_2(x) = f_1(x) - 2 = \dfrac{1}{|x|^5} - 2 = g(x)$



$g(x) = \left| \sqrt[3]{x+1} \right|$

<u>Sol</u>: $D_g: \mathbb{R}$

$f(x) = \sqrt[3]{x} = x^{\frac{1}{3}}$, $\frac{1}{3} < 1 \Longrightarrow$

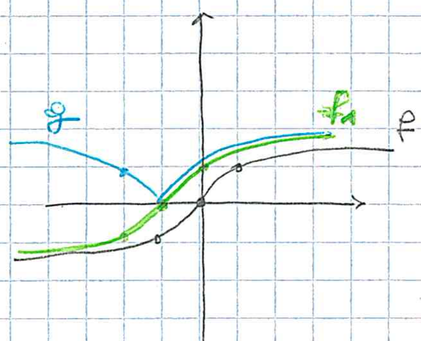


$D_f: \mathbb{R}$, $\nearrow$ lentamente

f. DISPARI

$f_1(x) = f(x+1) = \sqrt[3]{x+1}$

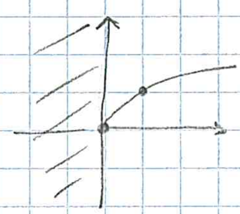
$f_2(x) = |f_1(x)| = \left|\sqrt[3]{x+1}\right| = g(x)$



$g(x) = -\sqrt[8]{(x-1)^3}$

<u>Sol</u>: $D_g: x-1 \geq 0 \Longrightarrow x \geq 1$

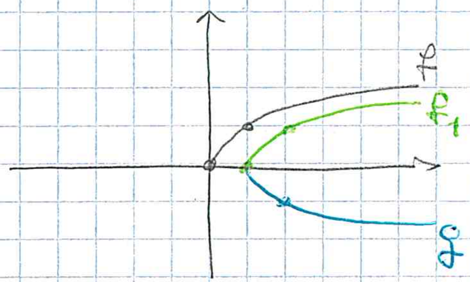
$f(x) = \sqrt[8]{x^3} = x^{\frac{3}{8}}$, $\frac{3}{8} < 1 \Longrightarrow$



$D_f: x > 0$, $\nearrow$ lentamente

$f_1(x) = f(x-1) = \sqrt[8]{(x-1)^3}$

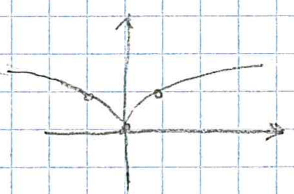
$f_2(x) = -f_1(x) = -\sqrt[8]{(x-1)^3} = g(x)$



$g(x) = \left| \sqrt[7]{x^4} - 2 \right|$

<u>Sol</u>: $D_g: \mathbb{R}$

$f(x) = \sqrt[7]{x^4} = x^{\frac{4}{7}}$, $\frac{4}{7} < 1 \Longrightarrow$

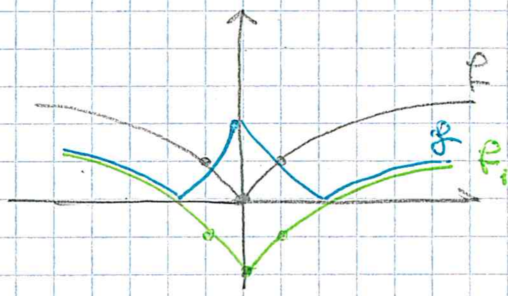


$D_f: \mathbb{R}$, $\nearrow$ lentamente

f. PARI

$f_1(x) = f(x) - 2 = \sqrt[7]{x^4} - 2$

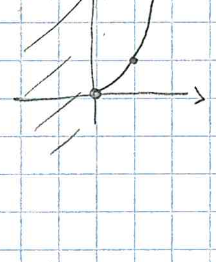
$f_2(x) = |f(x)| = \left|\sqrt[7]{x^4} - 2\right| = g(x)$



$g(x) = -\sqrt{(x-1)^3}$

<u>Sol</u>: $D_g: x-1 \geq 0 \Rightarrow x \geq 1$

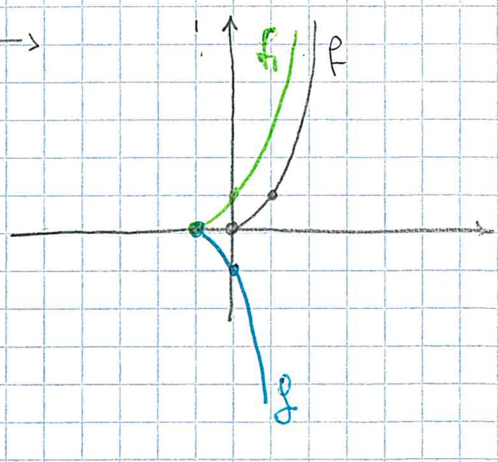
$f(x) = \sqrt{x^3} = x^{\frac{3}{2}}$, $\frac{3}{2} > 1 \Longrightarrow$



$D_f: x \geq 0$, $\nearrow$ velocemente

$f_1(x) = f(x-1) = \sqrt{(x-1)^3}$

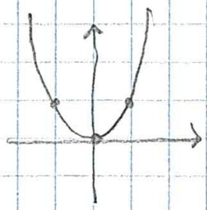
$f_2(x) = -f_1(x) = -\sqrt{(x-1)^3} = g(x)$



$g(x) = |\sqrt[3]{x^8} - 3|$

Sol: $D_g = \mathbb{R}$

$f(x) = \sqrt[3]{x^8} = x^{\frac{8}{3}} > 1 \Rightarrow$

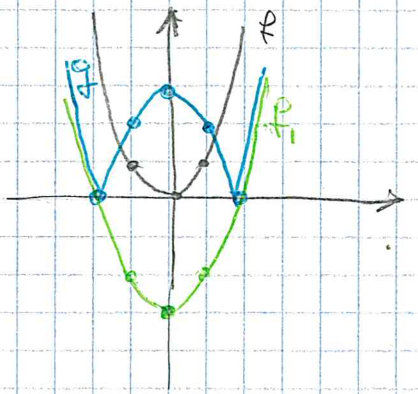


$D_f = \mathbb{R}$, $\nearrow$ veloce

f: PARI

$f_1(x) = f(x) - 3 = \sqrt[3]{x^8} - 3$

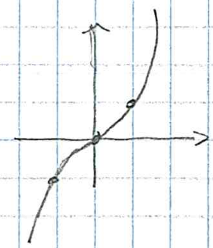
$f_2(x) = |f_1(x)| = |\sqrt[3]{x^8} - 3|$



$g(x) = \sqrt[3]{|x|^5} - 2$

Sol: $D = \mathbb{R}$

$f(x) = \sqrt[3]{x^5} = x^{\frac{5}{3}} > 1 \Rightarrow$

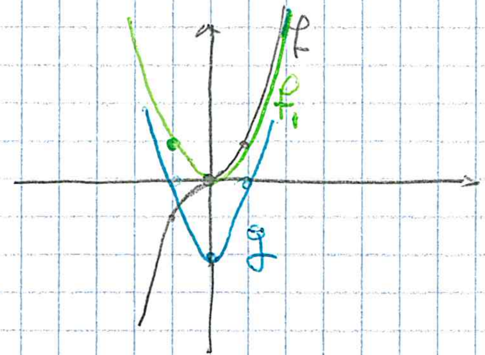


$D_f: \mathbb{R}$, $\nearrow$ veloce

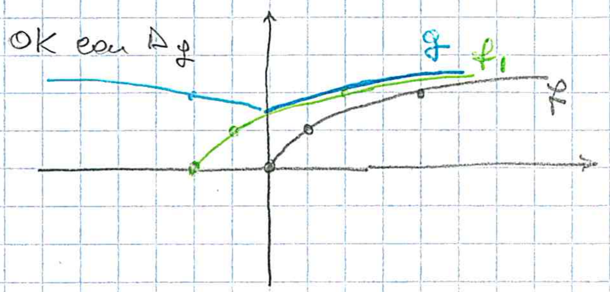
f: DISPARI

$f_1(x) = f(|x|) = \sqrt[3]{|x|^5}$

$f_2(x) = f_1(x) - 2 = \sqrt[3]{|x|^5} - 2$



$g(x) = \sqrt{|x|+2}$



Sol $\qquad D_g: \mathbb{R}$

queste sequenze è corretta

$$\begin{cases} f(x) = \sqrt{x} \qquad D_f: [0, +\infty) \\ f_1(x) = f(x+2) = \sqrt{x+2} \\ f_2(x) = f_1(|x|) = \sqrt{|x|+2} = g(x) \end{cases}$$

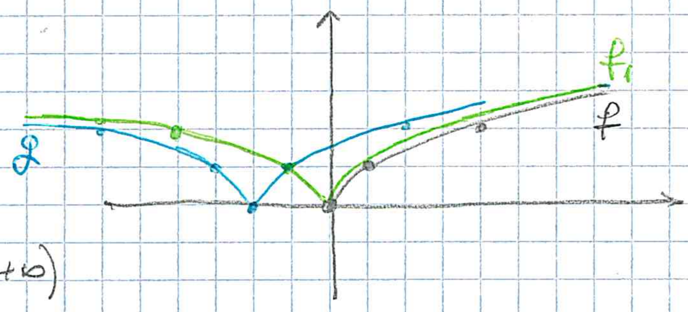
ok

queste sequenze non va bene

$$\begin{cases} f(x) = \sqrt{x} \\ f_1(x) = f(|x|) = \sqrt{|x|} \\ f_2(x) = f_1(x+2) = \sqrt{|x+2|} \neq g(x) \end{cases}$$

no

$g(x) = \sqrt{|x+2|}$



Sol $\qquad D_g: \mathbb{R}$

queste sequenze è corretta

$$\begin{cases} f(x) = \sqrt{x} \qquad D_f: [0, +\infty) \\ f_1(x) = f(|x|) = \sqrt{|x|} \\ f_2(x) = f_1(x+2) = \sqrt{|x+2|} = g(x) \end{cases}$$

ok

queste sequenze non va bene

$$\begin{cases} f(x) = \sqrt{x} \\ f_1(x) = f(x+2) = \sqrt{x+2} \\ f_2(x) = f_1(|x|) = \sqrt{|x|+2} \neq g(x) \end{cases}$$

no

$g(x) = -\sqrt{2-x} \implies g(x) = -\sqrt{-x+2}$

Sol: $D_g: 2-x \geq 0$

$-x \geq -2$

$x \leq 2$

$(-\infty; 2]$

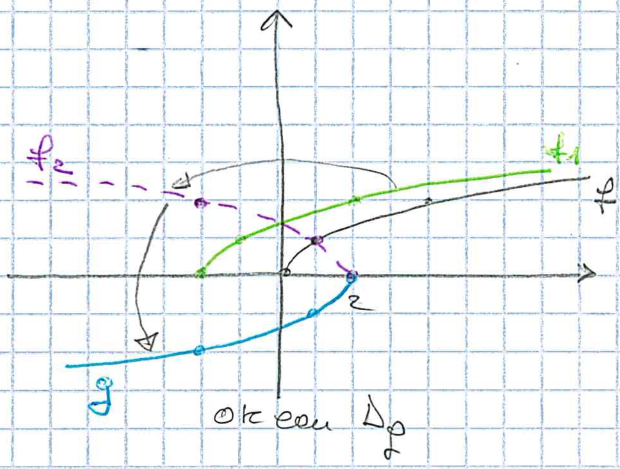
sequenze corrette

$f(x) = \sqrt{x}$

$f_1(x) = f(x+2) = \sqrt{x+2}$

$f_2(x) = f_1(-x) = \sqrt{-x+2}$

$f_3(x) = -f_2(x) = -\sqrt{-x+2} = g(x)$ ok



sequenze NON corrette

$f(x) = \sqrt{x}$

$f_1(x) = f(-x) = \sqrt{-x}$

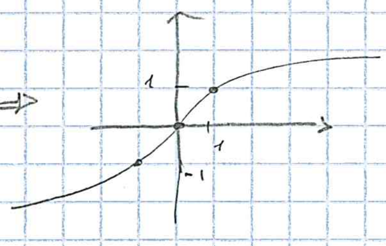
$f_2(x) = f_1(x+2) = \sqrt{-(x+2)} = \sqrt{-x-2} \neq g(x)$

$g(x) = \sqrt[3]{(2-x)^5} \implies g(x) = \sqrt[3]{(-x+2)^5}$

Sol: $D: \mathbb{R}$

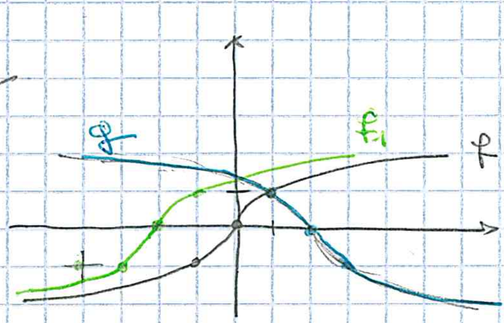
sequenze corrette

$f(x) = \sqrt[3]{x^5} = x^{\frac{5}{3}}$ >1 — $D_f = \mathbb{R}$, DISPARI, lenta $\implies$



$f_1(x) = f(x+2) = \sqrt[3]{(x+2)^5}$

$f_2(x) = f_1(-x) = \sqrt[3]{(-x+2)^5} = g(x)$ ok



sequenze NON corrette

$f(x) = \sqrt[3]{x^5}$

$f_1(x) = f(-x) = \sqrt[3]{(-x)^5} =$

$f_2(x) = f_1(x+2) = \sqrt[3]{(-(x+2))^5} = \sqrt[3]{(-x-2)^5} \neq g(x)$