

FCS
Math: Functions
Exercises

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Exercises

Exercise 1. *Given the functions $f : \mathbb{R} \rightarrow \mathbb{R}, \uparrow$ and $g : \mathbb{R} \rightarrow \mathbb{R}, \downarrow$, prove that the function $f \circ g : \mathbb{R} \rightarrow \mathbb{R}$ is \downarrow .*

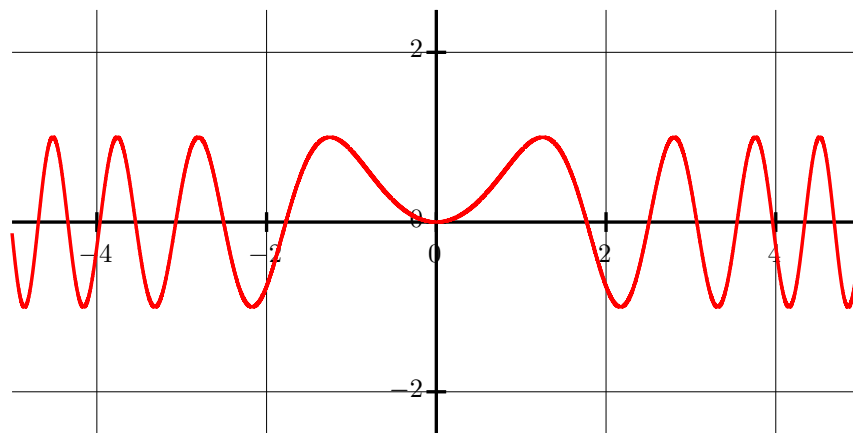
Exercise 2. *Given the functions $f : \mathbb{R} \rightarrow \mathbb{R}$, even and any $g : \mathbb{R} \rightarrow \mathbb{R}$, function $g \circ f : \mathbb{R} \rightarrow \mathbb{R}$ is even.*

Exercise 3. *Find examples of functions $f : \mathbb{R} \rightarrow \mathbb{R}$, even and any $g : \mathbb{R} \rightarrow \mathbb{R}$, odd such that $f + g$ is neither odd nor even.*

Exercise 4. *Find examples of functions $f : \mathbb{R} \rightarrow \mathbb{R}, \uparrow$ and $g : \mathbb{R} \rightarrow \mathbb{R}, \downarrow$ such that $f \cdot g$ is neither increasing nor decreasing.*

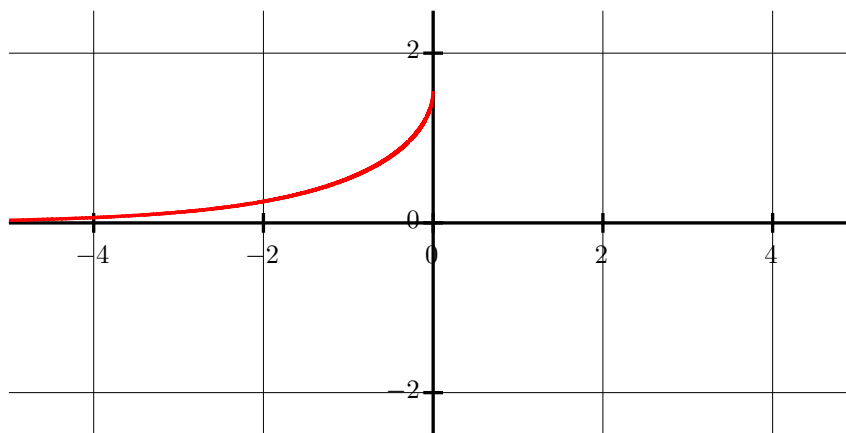
Exercise 5. Draw the graph of the quasi-function $f(x) = \sin(x^2)$. Find the existence field, intersection with the axis, zeroes, positivity and increasing intervals. Find maximum and minimums.

GNU1: The Graph of $f(x) = \sin(x^2)$



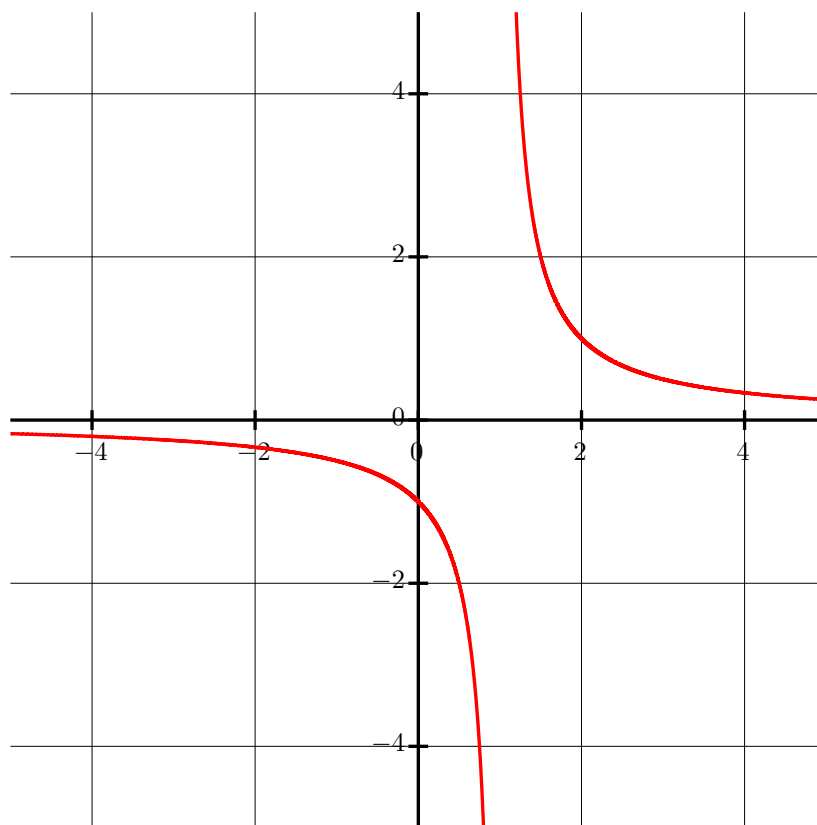
Exercise 6. Draw the graph of the quasi-function $f(x) = \arcsin(2^x)$. Find the existence field, intersection with the axis, zeroes, positivity and increasing intervals. Find maximum and minimums.

GNU2: The Graph of $f(x) = \arcsin(2^x)$



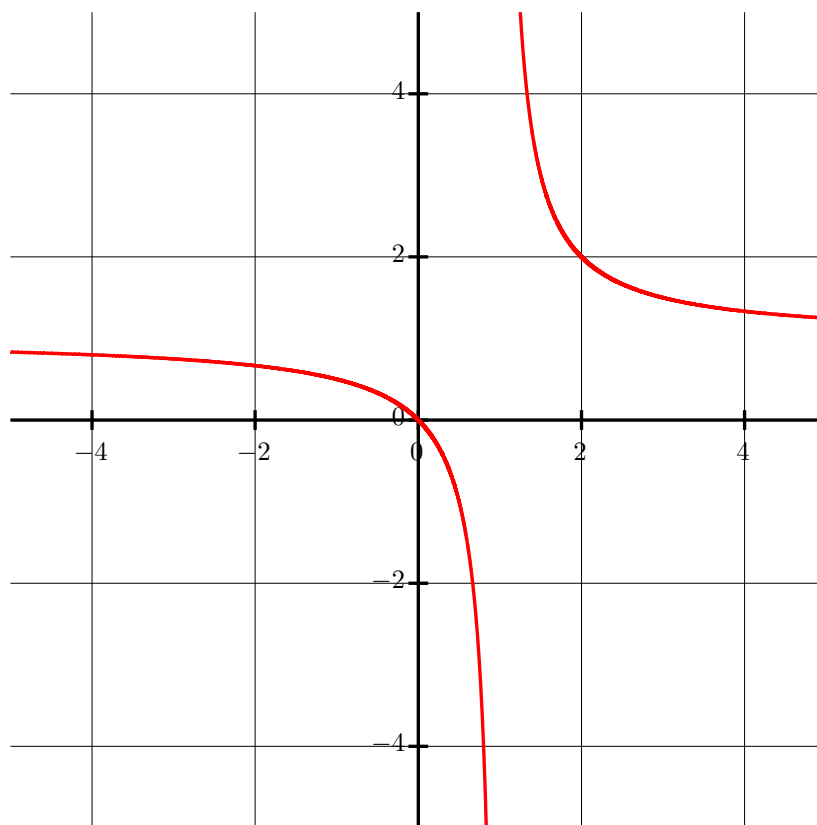
Exercise 7. Draw the graph of the quasi-function $f(x) = \frac{1}{x-1}$. Find the existence field, intersection with the axis, zeroes, positivity and increasing intervals. Find maximum and minimums.

GNU3: The Graph of $f(x) = f(x) = \frac{1}{x-1}$



Exercise 8. Draw the graph of the quasi-function $f(x) = \frac{x}{x-1}$. Find the existence field, intersection with the axis, zeroes, positivity and increasing intervals. Find maximum and minimum.

GNU4: The Graph of $f(x) = f(x) = \frac{x}{x-1}$



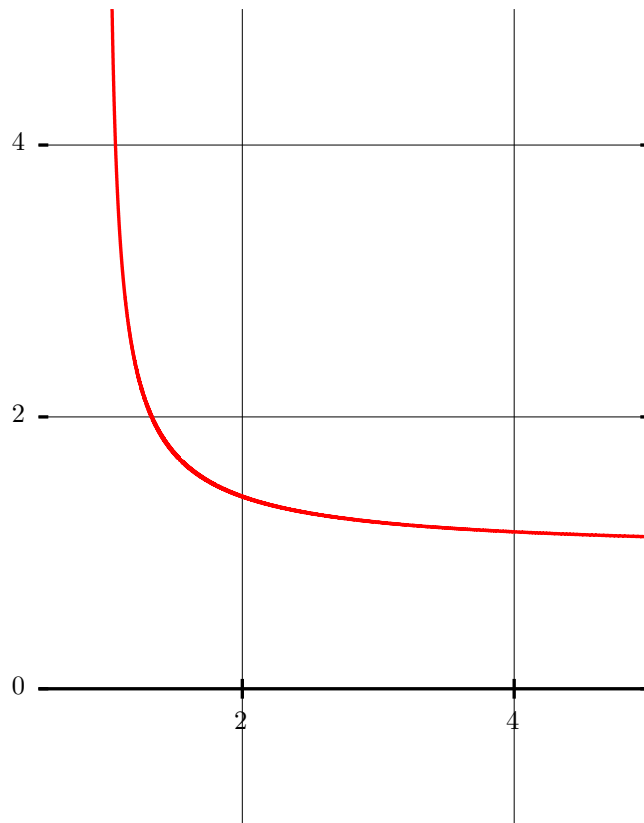
Exercise 9. Draw the graph of the quasi-function $f(x) = \frac{x}{\sqrt{x-1}}$. Find the existence field, intersection with the axis, zeroes, positivity and increasing intervals. Find maximum and minimums.

GNU5: The Graph of $f(x) = \frac{x}{\sqrt{x-1}}$



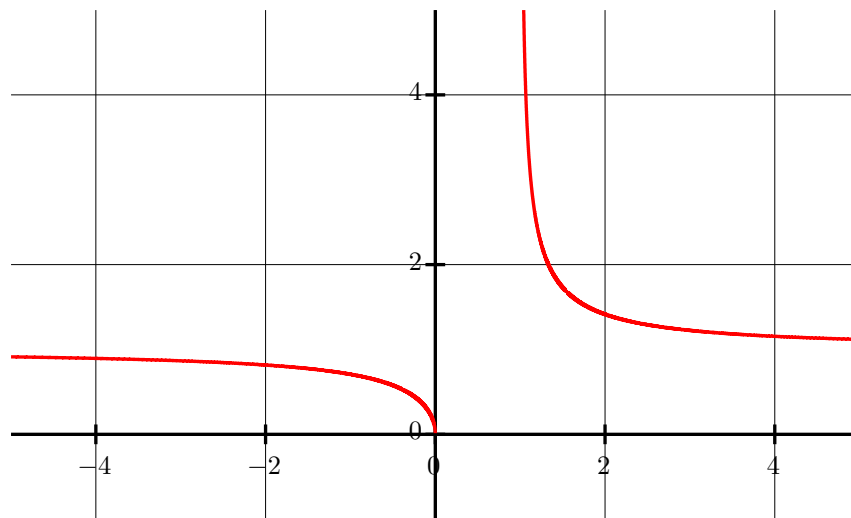
Exercise 10. Draw the graph of the quasi-function $f(x) = \frac{\sqrt{x}}{\sqrt{x-1}}$. Find the existence field, intersection with the axis, zeroes, positivity and increasing intervals. Find maximum and minimums.

GNU6: The Graph of $f(x) = \frac{\sqrt{x}}{\sqrt{x-1}}$



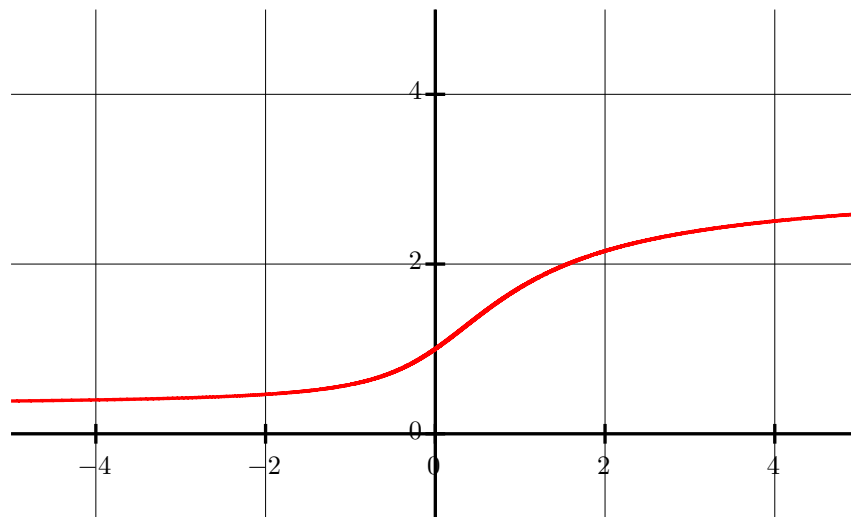
Exercise 11. Draw the graph of the quasi-function $f(x) = \sqrt{\frac{x}{x-1}}$. Find the existence field, intersection with the axis, zeroes, positivity and increasing intervals. Find maximum and minimums.

GNU7: The Graph of $f(x) = \sqrt{\frac{x}{x-1}}$



Exercise 12. Draw the graph of the quasi-function $f(x) = 2^{\arctan(x)}$. Find the existence field, intersection with the axis, zeroes, positivity and increasing intervals. Find maximum and minimums.

GNU8: The Graph of $f(x) = 2^{\arctan(x)}$



Exercise 13. Draw the graph of the quasi-function $f(x) = \log(|x + 1|)$. Find the existence field, intersection with the axis, zeroes, positivity and increasing intervals. Find maximum and minimums.

GNU9: The Graph of $f(x) = \log(|x + 1|)$

