FCS
Math: Functions
Exam-like exercises

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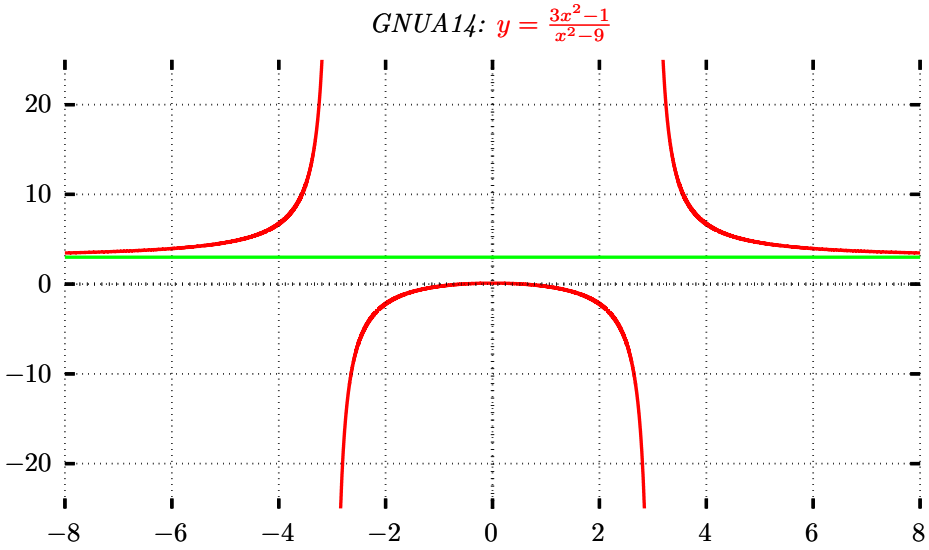
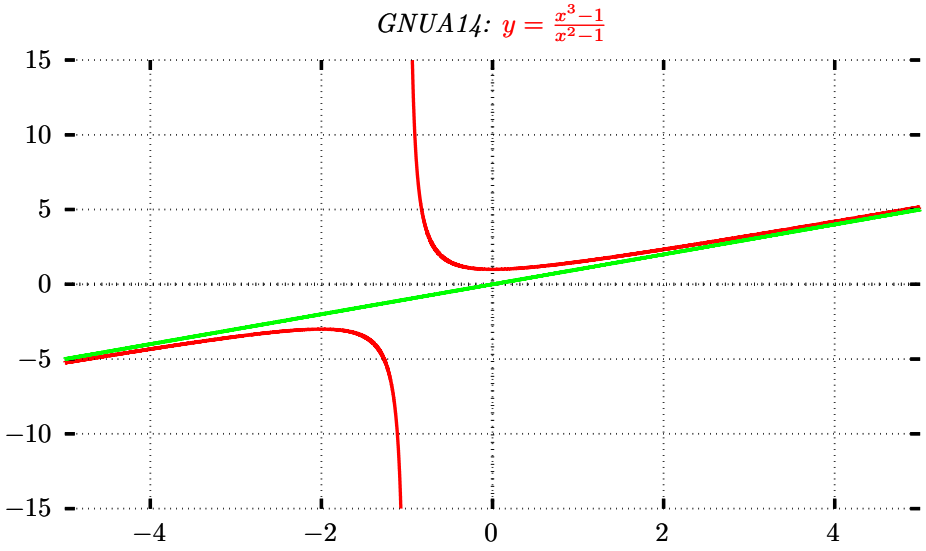
Exercise 1. *Draw the graph of the function, determining the domain, zeros, positivity, intervals of increase/decrease, extremal points, and asymptotes.*

$$\begin{array}{rccc} F: & \mathbb{R} & \longrightarrow & \mathbb{R} \\ & x & \mapsto & \frac{3x^2-1}{x^2-9} \end{array}$$



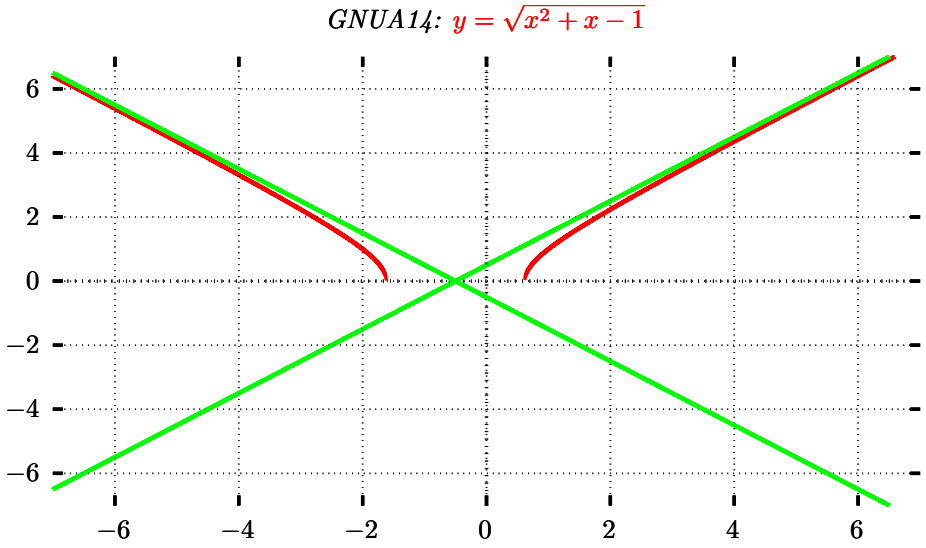
Exercise 2. *Draw the graph of the function, determining the domain, zeros, positivity, intervals of increase/decrease, extremal points, and asymptotes.*

$$\begin{array}{rccc} F: & \mathbb{R} & \longrightarrow & \mathbb{R} \\ & x & \mapsto & \frac{x^3-1}{x^2-1} \end{array}$$



Exercise 3. *Draw the graph of the function, determining the domain, zeros, positivity, intervals of increase/decrease, extremal points, and asymptotes.*

$$\begin{array}{rccc} F: & \mathbb{R} & \longrightarrow & \mathbb{R} \\ & x & \mapsto & \sqrt{x^2+x-1} \end{array}$$



Exercise 4. *Draw the graph of the function, determining the domain, zeros, positivity, intervals of increase/decrease, extremal points, and asymptotes.*

[Sturm required]

$$\begin{array}{rccc} F: & \mathbb{R} & \longrightarrow & \mathbb{R} \\ & x & \mapsto & \frac{x^3-9}{x^2-4} \end{array}$$

GNUA14: $y = \frac{x^3-9}{x^2-4}$