Math 0 Second Homework

Caboara

Dear students, please send the solutions to me by mail no later that Saturday, October 5th. Late solutions will not be graded. PDF or jpg or what suits you, BUT NO HEIC files. Please write down the solutions in the given order, first for ex 1, then 2 and so on.

Please answer showing all the necessary reasoning and steps AND MARK CLEARLY THE SOLUTIONS THEMSELVES.

You will receive the grading by Monday, October 6th, and the grades will count for the final grade for the MATH0 exam.

1. Given the function $\begin{array}{rccc} F\colon & \mathbb{R} & \to & \mathbb{R} \\ & x & \mapsto & 3(x+3)^2-2 \end{array}$
   - Draw the function graph.
   - Is the function is one-to-one, injective, surjective?
   - If not, shrink the domanin and codomain in such a way to make the function one-to-one

   Solution.

   - Draw the function graph.
   - Not one-to-one, not injective, not surjective.
   - $\begin{array}{rccc} F\colon & (-3,+\infty) & \to & [-2,+\infty) \\ & x & \mapsto & 3(x+3)^2-2 \end{array}$

   □

2. Given the formula
   $$\begin{array}{rccc} F\colon & \mathbb{R} & \to & \mathbb{R} \\ & x & \mapsto & \sqrt{x-4}-2 \end{array}$$
   - Is the formula a function?
   - Shrink the domain of F to make it a function and draw the graph.
   - Is the function is one-to-one, injective, surjective?
   - If not, shrink the domanin and codomain in such a way to make the function one-to-one

   Solution.

   - Not a function
   - $\begin{array}{rccc} F\colon & (4,+\infty) & \to & \mathbb{R} \\ & x & \mapsto & \sqrt{x-4}-2 \end{array}$
   - Only injective

- $\begin{array}{rccc} F\colon & (4,+\infty) & \to & (-2,+\infty) \\ & x & \mapsto & \sqrt{x-4}-2 \end{array}$

□

3. Given the formula $\begin{array}{rccc} F\colon & \mathbb{R} & \to & \mathbb{R} \\ & x & \mapsto & \frac{x+1}{x-3} \end{array}$
   - Is the formula a function?
   - Shrink the domain of F to make it a function and draw the graph.
   - Is the function is one-to-one, injective, surjective?
   - If not, shrink the domanin and codomain in such a way to make the function one-to-one

   Solution.

   - Not a function
   - $\begin{array}{rccc} F\colon & \mathbb{R}-\{3\} & \to & \mathbb{R} \\ & x & \mapsto & \frac{x+1}{x-3} \end{array}$
   - The function is injective
   - $\begin{array}{rccc} F\colon & \mathbb{R}-\{3\} & \to & \mathbb{R}-\{1\} \\ & x & \mapsto & \frac{x+1}{x-3} \end{array}$

□