

Introduction to Analysis 1(42001/52001 Section 01)

HW1, due Friday, September 9

Instructor: Prof. Artem Zvavitch

Problem 1. For each natural number i consider set

$$A_i = \{x : 0 < x < \frac{1}{i}\}.$$

Please find

- $\bigcap_{i=1}^{10} A_i$
- $\bigcup_{i=1}^{10} A_i$
- $\bigcap_{i=1}^{\infty} A_i$
- $\bigcup_{i=1}^{\infty} A_i$

Problem 2. Let $f : A \rightarrow B$ and let G, H be subsets of B . Using the definition of inverse image of a set under f prove that

$$f^{-1}(G \cap H) = f^{-1}(G) \cap f^{-1}(H).$$

Problem 3. Let $A = \{1, 2, 3, 4\}$ and $B = \{a, b, c\}$. Give an example of surjective function from A to B . Prove that there is no function $f : A \rightarrow B$ such that f is a bijection.