

Annotation for the 2nd week

We will start by recalling what we did last week. We should be able to solve the following.

Exercise. Rewrite the following statements:

- (i) Every class is liked by some student.
- (ii) There is a student who is good at the class which all students hate.

Exercise. Negate the following statements (Bonus: Is the statement true or false?):

- (i) Each woman is loved by some man.
- (ii) $\forall x \in \mathbb{R} \setminus \{0\} \exists y \in \mathbb{R} : x \cdot y = 1$.
- (iii) $\forall x, y \in \mathbb{R} : x \cdot y \geq 0 \Rightarrow x + y \geq 0$.

We will continue with the so-called mathematical induction (see the lecture). You can try to show that for any $n \in \mathbb{N}$ there holds $\sum_{k=1}^n k = \frac{n(n+1)}{2}$ or $\sum_{k=0}^n q^k = \frac{1-q^{n+1}}{1-q}$ for any $q \neq 1$.

Next, we will talk about supremum and infimum (also in the lecture). You can think about the meaning of the definition. What is the difference between $[0, 1]$ and $(0, 1]$?

Finally, we will discuss (primarily) inverse trigonometric functions (arcsin, arctan, ...). Some of you probably have not heard about them; in that case you can recall what you know about trigonometric functions (sin, tan, ...) and inverse functions in general. We do not need some deep knowledge; what it is and the picture is enough.