Unit I. Lessons distribution and self-assesment questions.

- Lesson 1. Sections 1.1, 1.2; 2.1, 2.2.

  1. If A is true, B is true, hence if A is not true, B will not be true. Is that correct?
  2. How can we try to prove a property if we don't know where to start from?
  3. Is $\mathbb{N}$ bijective with the set of multiples of 3? What can be deduced from it?
  4. What properties of the set $\mathbb{Z}$ do you think characterize it more with respect to $\mathbb{N}$?

- Lesson 2. Sections 2.3, 2.4; 3.1, 3.2.

  1. Every rational has an additive inverse ("opposite") and an additive inverse ("inverse"). True or false?
  2. $\mathbb{Z}$ has no first element, so it is not a countable set. It's true?
  3. Although in $\mathbb{Z}$ every element has an additive inverse, it is not a body. Why?
  4. If there is an order relation in K, then $\forall a, b \in K$, $a \leq b$ or $b \leq a$. Is it true?

- Lesson 3. Sections 3.3, 3.4, 3.5; 4.1, 4.2, 4.3.

  1. An ordered field is a field whose elements have an order relation. True or false?
  2. Obtain a lower bound and the infimum of the set of multiples of 3.
  3. Write the condition of belonging to the interval $(-2, 2)$ using the absolute value.
  4. Give an example of a monotone decreasing sequence, but not strictly decreasing.
  5. Give an example of a non-convergent sequence.
  6. Give an example of a Cauchy sequence.

- Lesson 4. Sections 5; 6.

  1. Reason if it is correct to say that there are more rational numbers than natural numbers.
  2. For each rational we can determine the one that follows it on the line. Is it true?
  3. How many representations can rational numbers take when expressed in decimal form?
  4. Give an example of a bounded set of rationals, without a supremum, but with an infimum.

- Lesson 5. Sections 7; 8.

  1. How many irrationals are there between two rationals? And how many rational?
  2. Since $\mathbb{R}$ is obtained by extending $\mathbb{Q}$, it retains all its properties. Is it true?
  3. What is the value of the $-1/3$ power of -8?
  4. Discuss whether any positive real can be the base of a system of logarithms.