Calculus on $\mathbb{R}$ Lect. dr. ANCA GRAD

Excercise 1 Fill in the following table, with the help of the notions from the lecture:

Nr.	A	LB A	UB A	inf A	sup A	min A	max A
1	$(-\infty, -1] \cup (2, +\infty)$						
2	$(-1, 9] \cup [10, 20)$						
3	$\left((-1, 9] \cup [10, 20) \right) \cap \mathbb{N}$						
4	$\{1, 2, 3\}$						
5	$\mathbb{N}$						
6	$\mathbb{R} \setminus \{1, 2, 3\}$						
7	$\mathbb{R} \setminus \mathbb{N}$						
8	$\mathbb{Z}$						
9	$\mathbb{R} \setminus \mathbb{Z}$						
10	$\mathbb{Q}$						
11	$\mathbb{R} \setminus \mathbb{Q}$						
12	$\mathbb{R}$						

Exercise 2:

Determine the same requirements as for Exercise 1, this time, for the sets:

$$A = \bigcup_{n \in \mathbb{N} \setminus \{1\}} \left(-1 + \frac{1}{n}, 1 - \frac{1}{n}\right), \quad B = \bigcup_{n \in \mathbb{N}} \left[-1 + \frac{1}{n}, 1 - \frac{1}{n}\right]$$

$$C = \bigcap_{n \in \mathbb{N} \setminus \{1\}} \left(-1 + \frac{1}{n}, 1 - \frac{1}{n}\right) \quad D = \bigcap_{n \in \mathbb{N}} \left[-1 + \frac{1}{n}, 1 - \frac{1}{n}\right]$$

$$E = \bigcup_{n \in \mathbb{N}} \left[-1 - \frac{1}{n}, 1 + \frac{1}{n}\right] \quad D = \bigcap_{n \in \mathbb{N}} \left(-1 - \frac{1}{n}, 1 + \frac{1}{n}\right)$$

Exercise 3:

Fill in the following table, by using ✓ when the set if a neighbourhood of -1 and ✗ when it is not :

$(-1, 2]$	$(-2, 1)$	$[-1, 1]$	$\mathbb{R} \setminus \{1\}$	Z	$\mathbb{R} \setminus (-1, 0)$	$\mathbb{Q}$

Argumentaţi (demonstraţi) fiecare afimaţie folosind rezultatele teoretice de la curs.