Name ...........................................................................................  row .... col....

| 1. | 2. | 3. | 4 | 5. | $\sum$ |
|---|---|---|---|---|---|
| | | | | | |

1. Write the mathematical formulas corresponding to the following statements with the help of the following signs only: propositional connectives, quantifiers, variables varying through set $\mathbb{N}$ and symbols indicated in brackets
*every polynomial of degree three has most three roots*$(\cdot, +, =, 0)$

2. Find $x$ such that the following is true (there might be more than one proper answers)
a) $\{\{1\},\{0,x\}\} \in \{\{0,\{1\}\},\{\{0\},\{1\}\},\{0,\{0,1\}\},\{1\},\{\{0\},1\},\{\{0\},\{0,1\}\}\}$

b) $\{\{1\},\{0,x\}\} \in \{\{0,\{1\}\},\{\{0\},\{1\}\},\{0,\{0,1\}\},\{1\},\{\{0\},1\},\{\{0\},\{0,1\}\}\}$

3. Find
$\bigcap_{i\in\mathbb{N}_+}[\frac{(-1)^i}{2i}, 1+\frac{1}{2i}] =$

$\bigcup_{i\in\mathbb{N}_+}[\frac{(-1)^i}{2i}, 1+\frac{1}{2i}] =$

4. Prove or disprove

$(C \setminus A) \cup [(A \cap B) \setminus C] = (A \cup C) \setminus [A \setminus (B \setminus C)]$

5. Prove or disprove

$[B \setminus (A \cup C)] \cup (A \cap B \cap C) = [B \setminus (A \setminus C)] \cap [B \setminus (C \cap A)]$

Name ......................................................................................... row .... col....

| 1. | 2. | 3. | 4 | 5. | $\sum$ |
|---|---|---|---|---|---|
| | | | | | |

1. Write the mathematical formulas corresponding to the following statements with the help of the following signs only: propositional connectives, quantifiers, variables varying through set $\mathbb{N}$ and symbols indicated in brackets
*every polynomial of degree three has at leas one root*$(\cdot, +, =, 0)$

2. Find $x$ such that the following is true (there might be more than one proper answers)
a) $\{\{0\},\{1,x\}\} \in \{\{0,\{1\}\},\{\{0\},\{1\}\},\{0,\{0,1\}\},0,\{\{0\},1\},\{\{0\},\{0,1\}\}\}$

b) $\{\{0\},\{1,x\}\} \subseteq \{\{0,1\},\{\{0\},\{1\}\},\{0,\{0,1\}\},\{0\},\{\{0\},1\},\{\{0\},\{0,1\}\}\}$

3. Find
$\bigcap_{i\in\mathbb{N}_+}[\frac{1}{2i}, 2+\frac{(-1)^i}{i}] =$

$\bigcup_{i\in\mathbb{N}_+}[\frac{1}{2i}, 2+\frac{(-1)^i}{i}] =$

4. Prove or disprove $(B \setminus A) \cup [(A \cap C) \setminus B] = (A \cup B) \setminus [A \setminus (C \setminus B)]$

5. Prove or disprove

$[A \setminus (B \cup C)] \cup (A \cap B \cap C) = [A \setminus (B \setminus C)] \cap [A \cap (C \setminus B)]$