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 a) $\mathbb{N}$ b) $\mathbb{R}$ and symbols indicated in brackets

a) *even numbers have no odd multiples*$(\cdot, +, =, 1)$

b) *there is no largest negative number* $(<, 0, =)$

2. Is the following formula a tautology?

Transform it into DNF form (e.i. $(x_1 \wedge x_2 \wedge x_3) \vee (..)... \vee (...)$ where x_i are variable or their negations)

$[(p \Leftrightarrow q) \wedge r] \Rightarrow [(p \wedge q) \vee \sim q]$

3. Prove or disprove a) $\mathcal{P}(\emptyset) \in \mathcal{P}(\mathcal{P}(\emptyset))$ b) $\mathcal{P}(\emptyset) \subseteq \mathcal{P}(\mathcal{P}(\emptyset))$

4. Proof by induction $41|5 \cdot 7^{2(n+1)} + 2^{3n}$

5. Are the following equalities true. Prove the true one, find a counterexample for the false one.
$[A \setminus (B \cup C)] \cup (B \cap C) = [A \setminus (B \div C)] \cup [(B \cap C) \setminus A]$

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

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 a) $\mathbb{N}$ b) $\mathbb{R}$ and symbols indicated in brackets

a) *multiplex of odd numbers are not necessary odd*$(\cdot, +, 1, =)$

b) *there is no smallest positive number* $(<, 0, =)$

2. Is the following formula a tautology?

Transform it into DNF form (e.i. $(x_1 \wedge x_2 \wedge x_3) \vee (..)... \vee (...)$ where x_i are variable or their negations)

$[(p \Leftrightarrow q) \vee r] \Rightarrow [(p \vee q) \wedge \sim q]$

3. Prove or disprove a) $\mathcal{P}(\emptyset) \in \mathcal{P}(\{\emptyset\})$ b) $\mathcal{P}(\emptyset) \subseteq \mathcal{P}(\{\emptyset\})$

4. Proof by induction $25|2^{n+2} \cdot 3^n + 5n - 4$

5. Are the following equalities true. Prove the true one, find a counterexample for the false one.
$[C \setminus (B \cup A)] \cup (B \cap A) = [C \setminus (B \div A)] \cup [(B \cap A) \setminus C]$

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