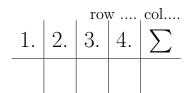
Name .....



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)  $\mathbb{Z}$  and symbols indicated in brackets

a) a number x has an odd  $multiple(\cdot, +, =, 1)$ 

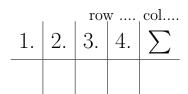
b) every positive number is a square of some number  $(\cdot,+,=,>,0)$ 

2. Prove or disprove  $(x, y, z \in \mathbb{R})$  $\forall y \forall z \exists x \ x \cdot y = z$ 

3. Proof by induction  $11|2^{6n+1} + 3^{2n+2},$  4. Is the following formula a tautology? Transform it into DNF form (e.i.  $(x_1 \land x_2 \land x_3) \lor (..) \ldots \lor (...)$ where  $x_i$  are variable or their negations)

 $[((p \lor r) \Rightarrow q) \Rightarrow r] \Rightarrow (p \land r)$ 

Name .....



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)  $\mathbb{Z}$  and symbols indicated in brackets

a) a number x has an even  $divisor(\cdot, +, =, 1)$ 

b) every positive number has a square  $root(\cdot, +, =, >, 0)$ 

2. Prove or disprove  $(x, y, z \in \mathbb{R})$  $\exists x \forall y \forall z \ x \cdot y = x \cdot z$ 

3. Proof by induction  $11|2^{6n+1} + 3^{2n+2}$ ,

4. Is the following formula a tautology? Transform it into DNF form (e.i.  $(x_1 \land x_2 \land x_3) \lor (..) \ldots \lor (...)$ where  $x_i$  are variable or their negations)

 $[(p \Rightarrow (q \land r)) \Rightarrow r] \Rightarrow (p \land r)$