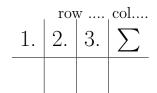
Name



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 \mathbb{N} and symbols indicated in brackets

a) square of an even number is $even(\cdot,+,=,1)$

b) there is no prime number divisible by $\mathcal{G}(\cdot,+,=,1,6)$

2. Proof by induction $1^2 - 2^2 + 3^2 - 4^2 + \dots (-1)^{n-1} n^2 = (-1)^{n-1} \frac{n(n+1)}{2}$ 3. Is the following formula a tautology? Transform it into CNF form (e.i. $(x_1 \lor x_2 \lor x_3) \land (..) ... \land (...)$ where x_i are variable or their negations)

 $(p \Leftrightarrow q) \Rightarrow [(\sim p \Rightarrow q) \land (p \Rightarrow \sim q)]$