

Name .....

	GA....	row ....	col....
1a	1b	2 .	3 . $\Sigma$

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) *odd number has odd divisors only*( $\cdot, +, =, 1$ )

b) *a sum of any number and its square is even*( $\cdot, +, =, 1, <$ )

2. Proof by induction

$$3|10^n + 7^n - 5.$$

3. For how many assignments the formula is true? Transform it into DNF form (e.i.  $(x_1 \wedge x_2 \wedge x_3) \vee (\dots) \vee (\dots)$  where  $x_i$  are variable or their negations)

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

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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) *not every even number has only even divisors* ( $\cdot, +, =, 1$ )

b) *product of any two consecutive numbers is even* ( $\cdot, +, =, 1, <$ )

2. Proof by induction

$3|13^n + 10^n + 1$ .

3. For how many assignments the formula is true? Transform it into DNF form (e.i.  $(x_1 \wedge x_2 \wedge x_3) \vee (\dots) \vee (\dots)$  where  $x_i$  are variable or their negations)

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