Disjunctive Syllogism using Steps 3 and 4
Hypothesis
Modus ponens using Steps 5 and 6
Reason
Hypothesis
Hypothesis
Modus ponens using Steps 1 and 2
Hypothesis
Modus tollens using Steps 3 and 4
Hypothesis
Disjunctive Syllogism using Steps 5 and 6
Hypothesis
Modus ponens using Steps 7 and 8
Conjunction of steps 3 and 9

HOMEWORK 3

P47-50

- 9. Let P(x) be the statement "x can speak Russian" and let Q(x) be the statement "x knows the computer language C^{++} ". Express each of the following sentence in terms of P(x), Q(x), quantifiers, and logical connectives. For the universe of discourse for quantifiers use the set of all students at your school.
- a) There is a student at your school who can speak Russian and who knows C^{++} .
- b)a) There is a student at your school who can speak Russian but who does not know C^{++} .
- c) Every student at your school either can speak Russian or knows C⁺⁺.
- d) No student at your school speak Russian or knows C++.

Solution: a) $\exists x (P(x) \land Q(x))$

- b) $\exists x (P(x) \land \neg Q(x))$
- c) $\forall x (P(x) \lor Q(x))$
- d) $\forall x \neg (P(x) \lor Q(x))$
- **62.** Let P(x), Q(x), R(x) and S(x) be the statement "x is a duck," "x is one of my poultry," "x is an officer," and "x is willing to waltz," respectively. Express the following statements using quantifiers; logical connectives; and P(x), Q(x), R(x) and S(x).
- a) No ducks are willing to waltz.
- b) No officers ever decline to waltz.
- c) All my poultry are ducks