

説明: Almost all formal proof systems (especially systems similar to the following one) are essentially acceptable, but using semantic tableau system may cause losing certain points.

You may use the following system, which contains implicational rules 1-8, equivalence rules 9-18, Conditional Proof (CP), Indirect Proof (IP), and 5 rules in predicate logic: one equivalence rule Quantifier Negation (QN), and 4 implicational rules: Universal Instantiation (UI), Existential Instantiation (EI), Universal Generalization (UG), Existential Generalization (EG).

- | | | | | | | | |
|------------|--|----------|--|----------|--|--|-------------------------|
| 1. MP | $p \supset q$ | 2. MT | $p \supset q$ | 3. DS | $p \vee q$ | | $p \vee q$ |
| | $p / \therefore q$ | | $\sim q / \therefore \sim p$ | | $\sim p / \therefore q$ | | $\sim q / \therefore p$ |
| 4. Simp | $p \bullet q / \therefore p$ | 5. Conj | p | 6. HS | $p \supset q$ | | |
| | $p \bullet q / \therefore q$ | | $q / \therefore p \bullet q$ | | $q \supset r / \therefore p \supset r$ | | |
| 7. Add | $p / \therefore p \vee q$ | 8. CD | $p \supset q$ | | | | |
| | | | $r \supset s$ | | | | |
| | | | $p \vee r / \therefore q \vee s$ | | | | |
| 9. DN | $p :: \sim \sim p$ | 10. DeM | $\sim (p \bullet q) :: \sim p \vee \sim q$ | 11. Comm | $(p \vee q) :: (q \vee p)$ | | |
| | | | $\sim (p \vee q) :: \sim p \bullet \sim q$ | | $(p \bullet q) :: (q \bullet p)$ | | |
| 12. Assoc | $[p \vee (q \vee r)] :: [(p \vee q) \vee r]$ | 13. Dist | $[p \bullet (q \vee r)] :: [(p \bullet q) \vee (p \bullet r)]$ | | | | |
| | $[p \bullet (q \bullet r)] :: [(p \bullet q) \bullet r]$ | | $[p \vee (q \bullet r)] :: [(p \vee q) \bullet (p \vee r)]$ | | | | |
| 14. Contra | $(p \supset q) :: (\sim q \supset \sim p)$ | 15. Impl | $(p \supset q) :: \sim p \vee q$ | | | | |
| 16. Exp | $[(p \bullet q) \supset r] :: [p \supset (q \supset r)]$ | 17. Taut | $p :: (p \bullet p)$ | | | | |
| | | | $p :: (p \vee p)$ | | | | |
| 18. Equiv | $(p \equiv q) :: [(p \supset q) \bullet (q \supset p)]$ | | | | | | |
| | $(p \equiv q) :: [(p \bullet q) \vee (\sim p \bullet \sim q)]$ | | | | | | |