Elements of Deductive Logic

Exercise set #3: Tableaux for Sentential Logic

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1 Tautologies and contradictions

Using the tableaux method, determine of each of the following wfs's whether it is a tautology, a contradiction or a contingency:

(a) $(((p \equiv q) \,\&\, \sim p) \supset \sim q)$

(b) $(p \supset q) \supset (q \supset p)$

(c) $(\sim (p \vee q) \equiv (\sim p \,\&\, \sim q))$

(d) $((p \,\&\, \sim p) \supset q)$

2 Validity

Use the tableaux method to check for validity. For each invalid argument, if any, indicate a truth assignment that makes its premises true and conclusion false.

(a) $(p \equiv (q \,\&\, r))$, $(q \supset r)$, q, therefore, p.

(b) $p \vee (q \& s), r \supset\sim p$, therefore $(r \supset q) \& (r \supset s)$

(c) $p \supset q, p \supset s$, therefore $\sim s \supset\sim q$

(d) $(p \& q) \equiv r, p \equiv\sim q$, therefore $\sim r$

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