

Philosophy 142: Modal Logic Exercises

September 29, 2008

1. Recall that the *strict conditional* \rightarrow is defined as $p \rightarrow q \equiv \Box(p \supset q)$. Which of the following inferences are truth-preserving? which are validity-preserving?

- (a) $q \models p \rightarrow q$
- (b) $(p \wedge q) \rightarrow r \models (p \rightarrow r) \vee (q \rightarrow r)$
- (c) $\neg(p \rightarrow q) \models p$

2. Show the following using tableaux. Where the tableau does not close, use it to define a counter-model and draw it.

- (a) $\vdash \Box A \equiv \neg \Diamond \neg A$
- (b) $\Box A, \Diamond B \vdash \Diamond(A \wedge B)$
- (c) $\not\vdash \Diamond p \supset \Box \Diamond p$
- (d) $\not\vdash \Diamond(p \vee \neg p)$