

Homework for Sept 25

1. Sider ex 4.2, 4.3(a,b).
2. Mendelsohn ex 2.7, 2.8(a-1), 2.9(a-c).
3. Prove that a formula ϕ is true in a model M iff the formula $\forall x\phi$ is true in M .
4. Show that axiom PC1 (as written in Sider) is valid.
5. Show that the rule Gen (as written in Sider) preserves validity.
6. **This problem concerns PL, not PC.** Suppose α is a subformula of β , and β' results from β by replacing zero or more occurrences of α in β by a wf ϕ . Then $\vdash (\alpha \leftrightarrow \phi) \rightarrow (\beta \leftrightarrow \beta')$. You do not need to prove this; but what do you think is the best way to start on the proof? How, in outline, do you think the proof should go? (Assume that you may not use the completeness theorem. Writing out a complete proof is not that hard, especially if you make good use of Sider's toolkit; give it a try if you like.)¹

¹It is possible to 'cheat' on this problem, but please don't.