

Homework #4: Section 2.2 #3 and #21. Also prove the following:

1. $\models \exists x(Qx \rightarrow \forall xQx)$ where Q is a 1-place predicate symbol
2. $\models \alpha \vee \beta[s]$ iff $\models \alpha[s]$ or $\models \beta[s]$. (i.e prove that our shorthand notation of writing $\alpha \vee \beta$ to mean the expression in our language $((\neg\alpha) \rightarrow \beta)$ actual means what we want it to!)
3. Let P denote a unary predicate symbol and f a binary function symbol. For each of the following formulas find a structure which satisfies the formula and one which does not.:
 - (a) $\forall v_1 f v_0 v_1 = v_0$
 - (b) $\exists v_0 \forall v_1 f v_0 v_1 = v_0$
 - (c) $\exists v_0 (P v_0 \wedge \forall v_1 P f v_0 v_1)$