

Exercise Sheet 11
CS 2210 Logic for Computer Scientists (Hitzler)
Solutions due: Tues November 25, 2014, 9:30am

Exercise 65 Show, that, for any formula F in which y does not occur as free variable, $\forall xF \equiv \forall yF[x/y]$.

Exercise 66 Transform all formulas from Example 3.1.5 into NNF.

Exercise 67 Show, using a tableau, that $\exists x(P(x) \wedge Q(x)) \models \exists xP(x) \wedge \exists yQ(y)$.

Exercise 68 Show, using a tableau, that $\exists x(O(s, x) \wedge A(x))$ is a logical consequence of the formulas in Example 3.1.5.

Exercise 69 Show, using a tableau, that $Q(a) \wedge Q(b) \wedge \forall x(P(x) \wedge (Q(x) \rightarrow \neg P(x)))$ is unsatisfiable.

Exercise 70 (no hand-in) Show, that the problem “Given a formula F and a finite set of formulas M , is $M \models F$?” is undecidable. [use Theorem 3.7.3]