

Homework 6: Predicate Logic: Derivations

CS521, Prof. Guttman

Due: 12 Oct 2010

Try to construct deductions for the following sequents. Report which ones are not derivable, so that the deduction cannot be completed.

1. $\forall x . R(x) \vdash \exists x . R(x)$
2. $\exists x . \forall y . R(x, y) \vdash \forall y . \exists x . R(x, y)$
3. $\forall y . \exists x . R(x, y) \vdash \exists x . \forall y . R(x, y)$
4. $\forall x . R(x) \wedge Q(x) \vdash (\forall x . R(x)) \wedge (\forall x . Q(x))$
5. $\exists x . R(x) \vee S(x) \vdash (\exists x . R(x)) \vee (\forall x . Q(x))$
6. $\vdash \forall x . \exists y . \forall z . R(x, y) \rightarrow R(x, z)$
7. $\vdash \forall x . \forall z . \exists y . R(x, y) \rightarrow R(x, z)$