

Logic 1, WS 2006. Homework 4, given Nov 23, due Nov 30

1. Find the sequent rule for the disjunction in the assumptions, by using the equivalent transformation of a disjunction into a formula containing only \wedge and \neg and by using the rules of the small calculus given in the lecture for formulae containing only \wedge and \neg .
2. Perform the same exercise for the case of implication in the conclusions.
3. Perform the same exercise for the situation when the assumptions include $\neg\phi$ and $\phi \vee \psi$. (It is similar to the modus ponens rule.)
4. Prove that the following sequent rule is correct:

$$\frac{\Phi \vdash \phi}{\Phi \vdash \phi \vee \psi}$$

5. (Optional) Give an example of a concrete correct sequent for which the previous sequent rule does not lead to a proof.