2nd Coursework
6. 3. 2002

See http://www.cs.nott.ac.uk/~txa/pt/ for basic definitions and pointers.

1. Derive the following propositions of classical predicate logic in (N) or (G):
   (a) \( \neg(\forall x.P(x)) \leftrightarrow \exists x.\neg P(x) \)
   (b) \( \neg(\exists x.P(x)) \leftrightarrow \forall x.\neg P(x) \)

   Which parts are derivable intuitionistically?

2. Show that the statement *In every non-empty pub there is a person such that if this person drinks then everybody drinks* is true by
   (a) Formalizing it in predicate logic – just using one predicate symbol \( D \) with arity 1 and assume the domain are the individuals present in a pub.
   (b) Proving it in classical predicate logic using (N) or (G).
   (c) (*) Under which conditions is the statement true intuitionistically?

3. (*) Show that cuts can be eliminated from the \( \Rightarrow \)-fragment of the classical sequent calculus.