

2nd Coursework

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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.