

Week 7

Exercises on first order logic translations

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1. Prove the following using the rules of natural deduction for intuitionistic propositional logic:

$$\vdash_{IPL} (\varphi \vee \psi) \rightarrow \neg(\neg\varphi \wedge \neg\psi)$$

2. Translate the following sentences from the natural language to the language of first order logic (provide the translation key):
 - a) Everyone went home in a car.
 - b) Everyone likes at least one movie.
3. Translate the following sentences from the language of first order logic to natural language (provide the translation key):
 - a) $\forall x[F(x) \rightarrow (G(x) \rightarrow H(a))]$;
 - b) $\exists x[F(x) \wedge G(x)] \rightarrow H(a)$;