TOPICS IN ALGEBRAIC LOGIC AND DUALITY THEORY
SEMINAR SHEET 2

- The contents of this seminar sheet will be discussed on **June 06**;
- Pick one or more examples to work out in full detail; you do not need to work on all of the examples.
- Examples are roughly ordered by conceptual difficulty, relative to the material covered in lectures.

(1) **(Craig implies deductive)** Show that for logics L with a local deduction theorem, the Craig interpolation property implies the deductive interpolation property.

(2) (Examples of Beth property)
Study the Beth property for the following logics:
(a) $\mathbf{K}$;
(b) $\mathbf{KT} = \mathbf{K} \oplus \Box p \to p$.
(c) $\mathbf{KTB} = \mathbf{K} \oplus \Box p \to p \oplus p \to \Box\Diamond p$.

(3) **Craig implies Beth** Show that for a logic L which is compact, conjunctive and has a local deduction theorem[1], the Craig interpolation property implies the (infinitary) Beth definability property.

(4) (**Superamalgamation and epimorphism surjectivity**) Show directly (i.e., without recourse to logic) that for a class of ordered algebras $\mathcal{K}$, superamalgamation implies epimorphism surjectivity.

[1]Also known technically as a *mildly decent* logic.