

MATH43051/63051 First midterm exam

22 October 2014. Work in by 3 November 2014.

Let A be an infinite set and S an infinite subset of A . Let \mathfrak{A} be the structure $\langle A; S \rangle$. What is the similarity type of \mathfrak{A} ?

Denoting this similarity type by σ , prove that the following two statements are equivalent:

- (i) $A \setminus S$ is infinite;
- (ii) for all \mathcal{L}_σ -structures \mathfrak{B} with $\mathfrak{A} \subseteq \mathfrak{B}$ we have that $\mathfrak{A} \preceq \mathfrak{B}$ (i.e. \mathfrak{A} is an elementary substructure of \mathfrak{B}).