

Esercizio 1. Let M an L -structure and let $\psi(x), \varphi(x, y) \in L$. Write a sentence true in M exactly when

- a. $\psi(M) \in \{\varphi(a, M) : a \in M\}$;
- b. $\{\varphi(a, M) : a \in M\}$ contains at least two sets;
- c. $\{\varphi(a, M) : a \in M\}$ contains only sets that are pairwise disjoint.

Esercizio 2. Let M be a structure in the signature of graphs (but not necessarily a graph). Write a sentence ψ such that,

- a. $M \models \psi$ if and only if there is an $A \subseteq M$ such that $r^M \subseteq A \times \neg A$.