

**Esercizio 1.** Let  $p(x) \subseteq L(A)$  and let  $\varphi(x; y) \in L(A)$  be a formula that defines, when restricted to  $p(\mathcal{U})$ , an equivalence relation with finitely many classes. Prove that there is a finite equivalence relation definable over  $A$  that coincides with  $\varphi(x; y)$  on  $p(\mathcal{U})$ .

**Esercizio 2.** Let  $A \subseteq \mathcal{U}$  and let  $\mathcal{A}$  be a definable set with finite orbit over  $A$ . Without using the eq-expansion, prove that  $\mathcal{A}$  is union of classes of a finite equivalence relation definable over  $A$ .

**Esercizio 3.** Let  $T$  be strongly minimal and let  $\varphi(x; z) \in L(A)$  with  $|x| = 1$ . For arbitrary  $b \in \mathcal{U}^{|z|}$ , prove that if the orbit of  $\varphi(\mathcal{U}; b)$  over  $A$  is finite, then  $\varphi(\mathcal{U}; b)$  is definable over  $\text{acl}A$ .

**Esercizio 4.** Let  $T$  have weak elimination of imaginaries. Prove that for every  $A \subseteq \mathcal{U}$  the following are equivalent

1.  $a \equiv_A^{\text{Sh}} b$ ;
2.  $a \equiv_{\text{acl} A} b$ .