

**Esercizio 1.** Let  $p(x) \subseteq L(A)$  and let  $\varphi(x; y) \in L(A)$  be a formula that defines, when restricted to  $p(\mathcal{U}^x)$ , 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  $p(\mathcal{U}^x)$ .

**Esercizio 2.** 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  $\varphi(\mathcal{U}^x; b)$  over  $A$  is finite, then  $\varphi(\mathcal{U}^x; b)$  is definable over  $\text{acl}A$ .

**Esercizio 3.** Let  $T$  have elimination of imaginaries and  $\varphi(x; z) \in L(A)$ . For arbitrary  $c \in \mathcal{U}^z$ , prove that if the orbit of  $\varphi(\mathcal{U}^x; c)$  over  $A$  is finite, then  $\varphi(\mathcal{U}^x; c)$  is definable over  $\text{acl}A$ .

**Esercizio 4.** Let  $\bar{a}$  be a sequence such that  $a \upharpoonright_{I_0} \equiv a \upharpoonright_{I_1}$  for every  $I_0, I_1$  such that  $I_0 < I_1$ . Prove that  $\bar{a}$  is a sequence of indiscernibles.

**Esercizio 5.** Let  $\bar{\mathcal{D}} = \langle \mathcal{D}_n : n < \omega \rangle$  be a sequence of definable sets of sort  $\sigma(x; z)$ . Prove that if  $\bar{\mathcal{D}}$  is a sequence of indiscernibles over  $A$  in  $\mathcal{U}^{\text{eq}}$ , then there is a sequence of  $A$ -indiscernibles  $\bar{b} = \langle b_n : n < \omega \rangle$  such that  $\bar{\mathcal{D}}_n = \sigma(\mathcal{U}^x; b_n)$ .

**Esercizio 6.** Prove that following are equivalent for every  $A \subseteq \mathcal{U}$

1.  $\text{acl}^{\text{eq}}A = \text{dcl}^{\text{eq}}(\text{acl}A)$  for every  $A \subseteq \mathcal{U}$
2.  $\text{Aut}(\mathcal{U}/\text{acl}^{\text{eq}}A) = \text{Aut}(\mathcal{U}/\text{acl}A)$
3.  $c \equiv_{\text{acl}A} b \Leftrightarrow c \overset{\text{Sh}}{\equiv}_A b$  for every  $A \subseteq \mathcal{U}$  and  $c, b \in \mathcal{U}^{<\omega}$ .