7 $A \subseteq X$ retr forte def $\Longrightarrow$ $i : A \hookrightarrow X$ induce $i_* : \pi_1(A,a) \longrightarrow \pi_1(X,a)$, $\forall a \in A$
isomorfismo

$A \subseteq X$ retr forte def di X se $\exists\, r : X \longrightarrow A \mid i \circ r \sim_A id_X$

oppure se e solo se $\exists\, F : X \times I \longrightarrow X \mid F(x,0) = x,\ F(x,1) \in A,\ \forall x \in X \ \wedge\ F(a,t) = a,\ \forall a \in A$
$\forall t \in I$

ritratto def forte

$$\underbrace{i \circ r \sim_A id_X \quad \wedge \quad r \circ i = id_A \;\Downarrow\; r \circ i \sim id_A}$$

$\because A \subseteq X$

$A \sim X \implies i : A \hookrightarrow X$ equivalenza omotopica

teor 2.4.2

$\Longrightarrow \quad i_* : \pi_1(A,a) \longrightarrow \pi_1(X,a)$ isomorfismo, $\forall a \in A$

$a = i(a)$