

Kapovitch's class, Mon Feb 9: Priyam Patel on RF, Separability, LERF

February-09-15 11:10 AM

Def 5 ① A group G is residually finite ^{RF} if if
 $\forall g \in G \setminus \{1\} \exists G' \leq G$ s.t. $g \notin G'$.
 \Leftrightarrow (same with \triangleleft)

② $H \leq G$ is separable if $\forall g \in G \setminus H \exists G' \geq H$
 w/ $g \notin G'$

③ G is LERF / subgroup separable if
 every f.g. $H \leq G$ is separable (\Rightarrow RF)

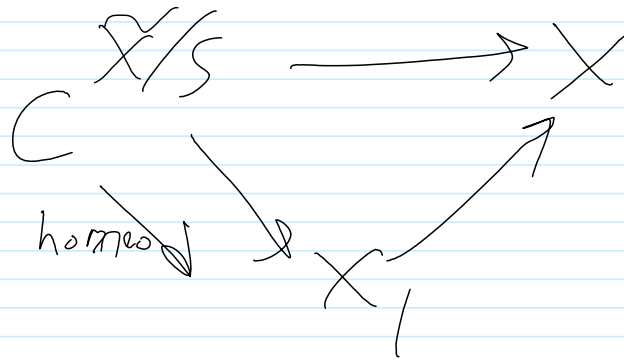
Claim Finitely presented residually finite group has solvable word problem!

Topology ^{RF:} $\sqrt{\pi_1(M)} = G, \gamma \in \pi_1(M)$ s.t. $\gamma \notin H$
 $\Rightarrow \exists$ finite cover s.t. γ lifts to an open curve.

Separability: Roughly, can lift self-intersecting surfaces to embedded surfaces

Lemma (Scott '78) Let X be a T_2 top. space w/ regular cover \tilde{X} w/ group G . (Typically, $X=M, \tilde{X}$ univ. cover) Then

G is LERF iff given $S \subseteq G$ f.g. & compact $C \subset \tilde{X}/S$ the \exists finite cover X_1 of X s.t. $\tilde{X}/S \rightarrow X$ factors through X_1 & C projects by a homeomorphism to X_1



PF . . .