

Geometric and Asymptotic Group Theory I (Prof. G. Arzhantseva)

RAAGs

Winter semester – 2013 – Exam questions

- (1) RAAGs: definitions via a group presentation and universal property, basic properties and (non)-examples.
- (2) RAAGs: topological definition, the contractibility of the universal cover of the Salvetti complex (sketch of Osajda's combinatorial proof).
- (3) Von Dyck's theorem, special subgroups of RAAGs, special HNN-extensions, the universal property of special HNN-extensions. A RAAG can be obtained successively via special HNN-extensions.
- (4) Residually finite groups, (non)-examples. Residual finiteness of HNN extensions with finite base group.
- (5) Residual finiteness of RAAGs.
- (6) Ping-pong lemma in free groups and in RAAGs.
- (7) Characterization of RAAGs over a finite graph all of whose finitely generated subgroups are RAAGs: Lemma 1 and Lemma 2.
- (8) Characterization of RAAGs over a finite graph all of whose finitely generated subgroups are RAAGs: the reverse implication, A(C_4).
- (9) Characterization of RAAGs over a finite graph all of whose finitely generated subgroups are RAAGs: the reverse implication, A(L_3).
- (10) Characterization of RAAGs over a finite graph all of whose finitely generated subgroups are RAAGs: the reverse implication, remaining case.
- (11) Ends of groups: definition, (non)-examples, 0-1-2-infty theorem.
- (12) Ends of groups: Stallings theorem (proof of one implication).
- (13) Characterization of RAAGs over a finite graph all of whose finitely generated subgroups are RAAGs: the reverse implication, connectedness of the graph.
- (14) Graph products: definition, (non)-examples, normal form, Hsu-Wise's theorem.
- (15) Coxeter groups and subgroups, theorem on the graph product of Coxeter subgroups, linearity of RAAG's.
- (16) Asymptotic dimension: definition, (non)-examples, invariance under coarse equivalence.
- (17) From wall spaces to CAT(0)-cubical complexes.
- (18) Characterization of hyperbolic graph products: Claim 1.
- (19) Characterization of hyperbolic graph products: Claim 2.