

LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN

MATHEMATISCHES INSTITUT



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## Geometric Group Theory

Sheet 6

**Exercise 1.** Show that  $A = \begin{pmatrix} 1 & n \\ 0 & 1 \end{pmatrix}$  and  $B = \begin{pmatrix} 1 & 0 \\ n & 1 \end{pmatrix}$  generate a rank 2 free subgroup of  $SL(2, \mathbb{Z})$ .

**Exercise 2.** Show that the reduced tree pair diagram representing an element of the Thompson's group F is unique.

**Exercise 3.** Find tree pair diagrams for three elements of F that generate a subgroup isomorphic to  $F \times \mathbb{Z}$ .

**Exercise 4.** Prove that the homomorphism  $\psi_0 \times \psi_1 : F \to \mathbb{Z}^2$  defined in the lecture is the abelianization map of F.

You can hand in your solutions during the exercise classes.