

Prof. Dr. Elmar Vogt
Sebastian Meinert

Free Groups and Graphs

Winter 2012/2013

Homework 10

Due: January 7, 2013

Task 1

Find a basis of the subgroup $\langle ab^{-1}a^{-1}, ba \rangle \cap \langle bba, aba^{-1}b^{-1}, aaab \rangle \leq F(a, b)$.

Task 2

Recall that the abelianization of F_2 is given by $\mathbb{Z}^2 = \mathbb{Z} \oplus \mathbb{Z}$, and consider the natural map $Aut(F_2) \rightarrow Aut(\mathbb{Z}^2)$. Determine the images of all Whitehead automorphisms under this map and show that the map is surjective.

Task 3

Let $\varphi \in Aut(F(a, b))$ be given by $\varphi(a) = a^{-1}ba$, $\varphi(b) = bba$. Write φ as a composition of Whitehead automorphisms.

Task 4

Have a Merry Christmas and a Happy New Year!