

# GEOMETRIC GROUP THEORY

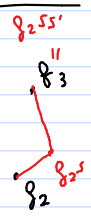
LAURA CIOBANU

ART OF STUDYING GROUPS  
USING PICTURES

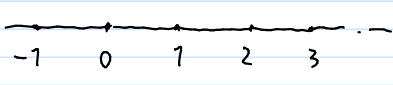
ALEXANDRE MARTIN  
A.S.

DEFN:  $\Gamma$  GROUP  $\Gamma = \langle S \rangle \quad |S| < \infty$

CAYLEY GRAPH  $CAY(\Gamma, S) =$   
 VERTICES =  $\Gamma$   
 EDGES  $(g, gs)$   
 EDGES HAVE LENGTH 1



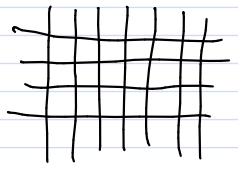
$\mathbb{Z}, \{1\}$



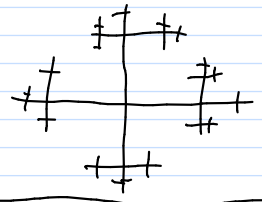
$\mathbb{Z}, \{2, 3\}$



$\mathbb{Z}^2, \{(0,1), (1,0)\}$



$F_2$ , BASIS



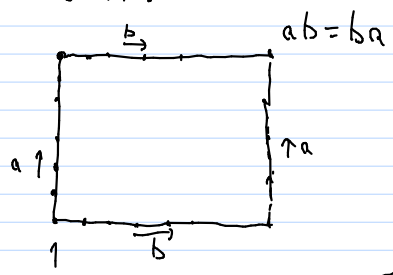
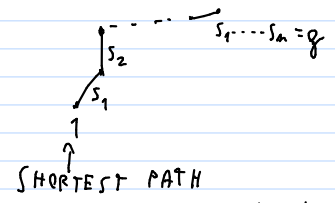
## ALGEBRA

$$g = s_1 \dots s_m$$

↑  
MINIMAL  $m$

$$ab = ba$$

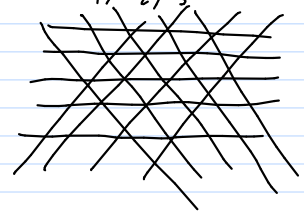
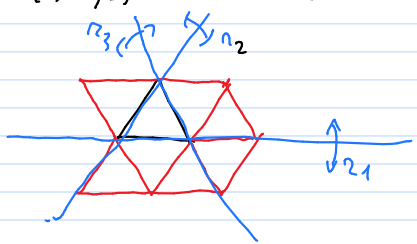
## PICTURE

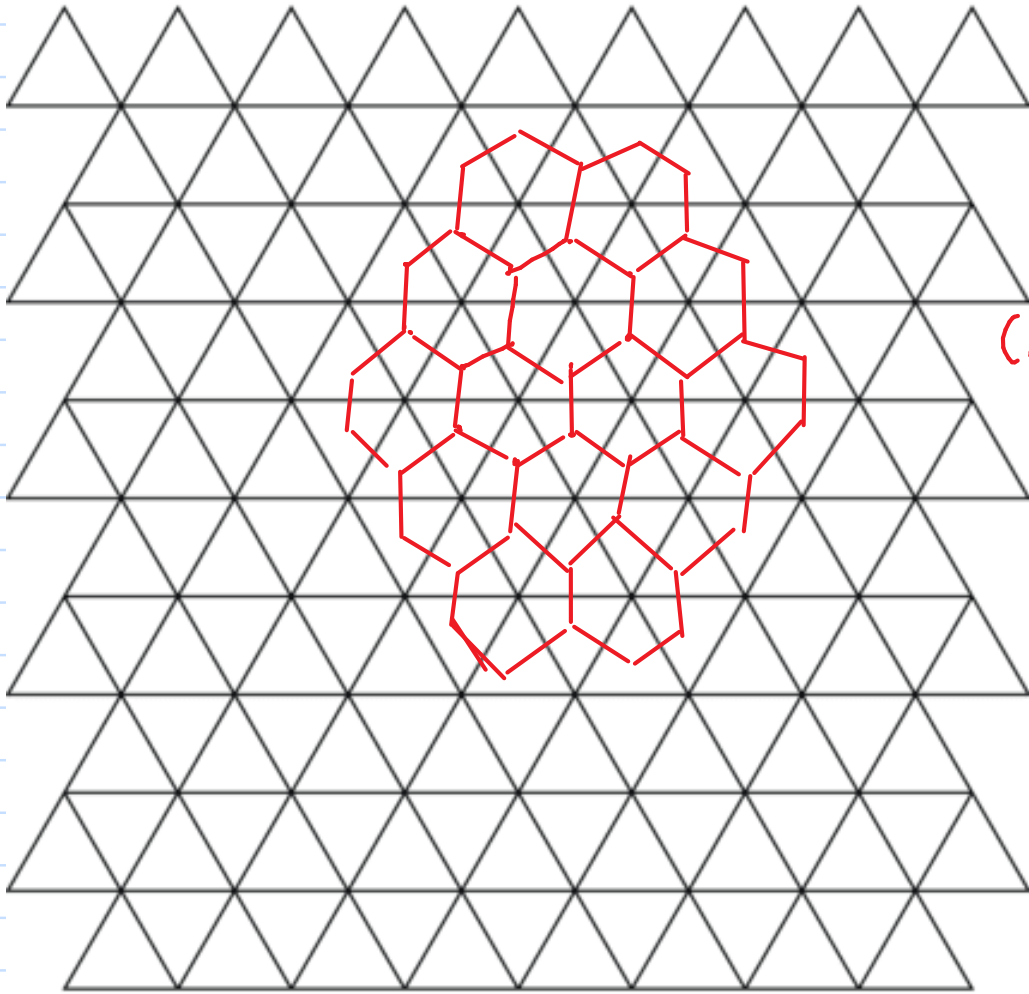


## CONTENTS:

- ① BASICS:  $CAY(\Gamma, S)$ , ACTIONS ON METRIC SPACES
- ② HYPERBOLIC GROUPS
- ③ COXETER GRS

$(3,3,3)$  - TRIANGLE GROUP  $\Gamma = \langle r_1, r_2, r_3 \rangle$





$(A_7(G, \{z_i\}))$