

# Group theory

甄景贤 Yan King Yin general.intelligence@gmail.com

August 23, 2019

## 1 HNN extensions

## 2 Cayley graph

notation  $\Gamma(G, X)$  where  $G$  is the group,  $X$  is the generator.

## 3 Bass-Serre theory

A group  $G$  is a free group iff it acts freely and without inversions on a tree.

Let  $X$  be a finite set of generators for a group  $G$ . Then  $G$  is **word hyperbolic** if  $(\Gamma(G, X), d)$  is hyperbolic, where  $d$  is the path metric on  $G$  (the vertex set of  $\Gamma(G, X)$ ).