Rank in the free group?

- A **band** in the free group is a conjugate of a generator. Rank rk_F is defined similarly.

- rk_F gives upper bound on rk

- Suggests how to approach computational questions.

- Identify free words with positive band presentations [Orekov, 2004].

Inductive relationships

- Splitting: $rk_F(wv) \leq rk_F(w) + rk_F(v)$ for $w, v \in F_n$,

  - Band presentations can be concatenated.

- Conjugacy: $rk_F(vwv^{-1}) = rk_F(w)$

  - Conjugate each term in a band presentation.