Fundamental quotients
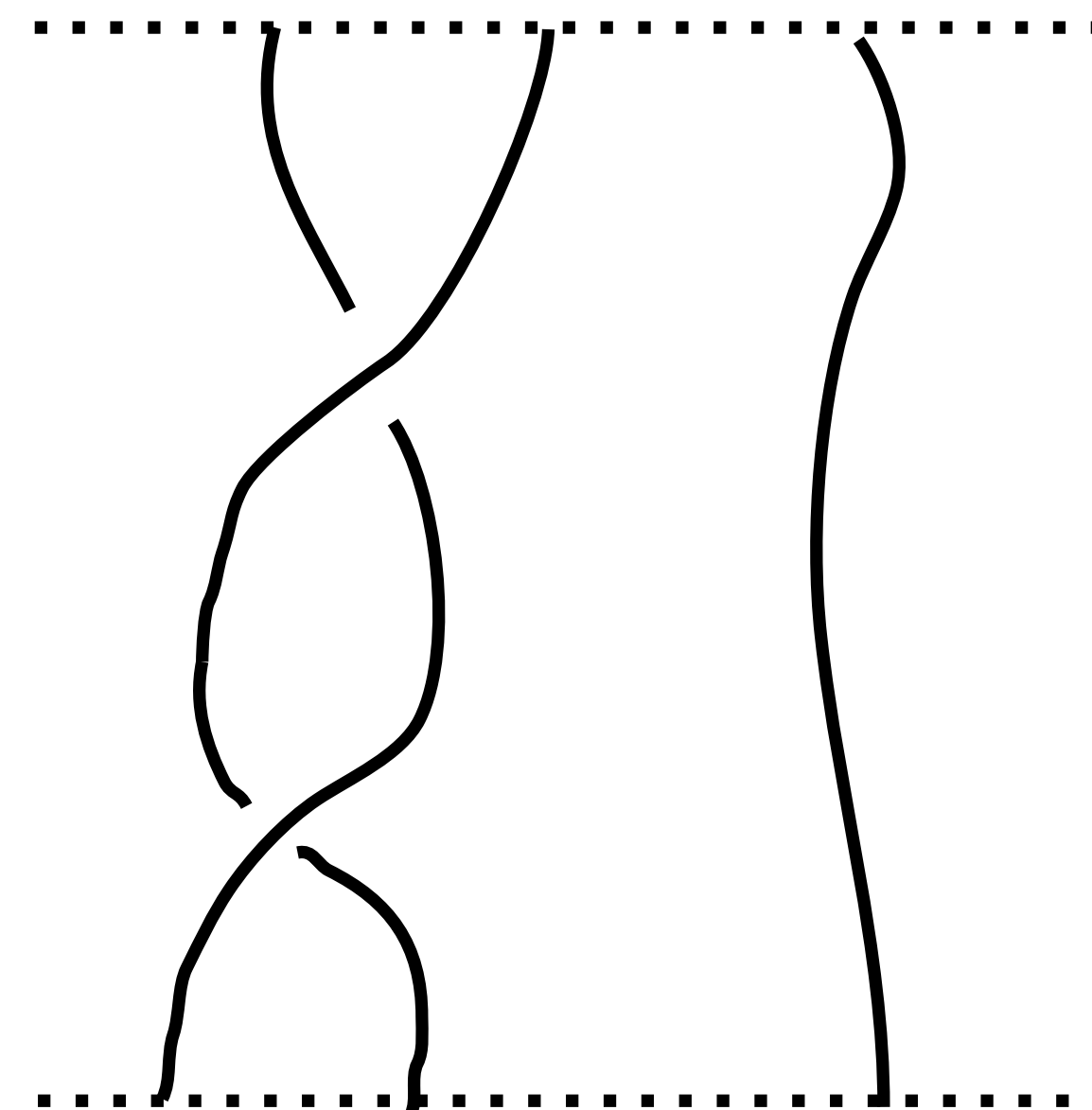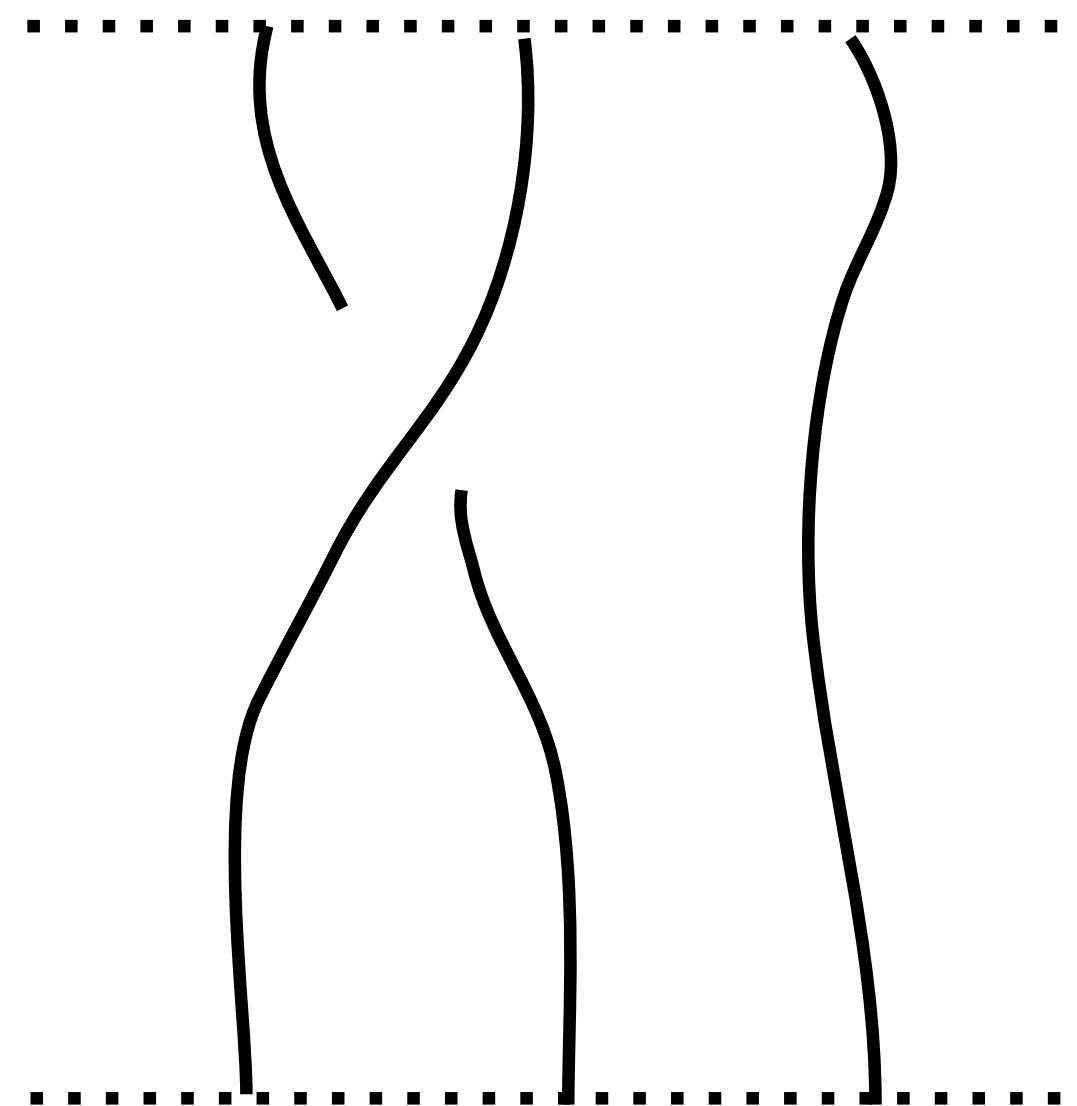
- Exponential sum $\gamma: B_n \to \mathbb{Z}$.

- $$\gamma(\sigma_{i_1}^{\epsilon_1}\ldots\sigma_{i_m}^{\epsilon_m}) = \sum_{i=1}^{m} \epsilon_i$$

- Permutation: $\phi: B_n \to S_n$

- $\phi(\sigma_i) = (i \;\; i+1)$

The rank