Math 9100 Homework 2

1. A group G is called *locally indicable* if every nontrivial finitely generated subgroup $H \subset G$ surjects $\mathbb{Z}$. Use the semidirect product structure of the pure braid groups to show that P_n is locally indicable for every n.

Remark/Motivation: Local indicability has many nice consequences, including orderability. Thus P_n is orderable. The full braid group B_n is also orderable, although it is not locally indicable in general. As a concrete counterexample, the commutator subgroup $[B_n, B_n]$ is finitely generated but has trivial abelianization for $n \geq 5$.

2. Exercise 3.1.1 in Kassel–Turaev.

3. Exercise 3.2.3 in Kassel–Turaev.