

These exercises are mainly taken from the sixth week's lectures. Please let me know if any of the problems are unclear or have typos.

Exercise 6.1. Starting with the standard diagrams find Schubert normal form for the trefoil, figure eight, Hopf link, and Whitehead link. Find Schubert normal form for the $(2, p)$ -torus links. There will be a nice pattern to these two-bridge positions. [Harder: What is Schubert normal form for the $(3, p)$ -torus links?]

Exercise 6.2. Show that the $(2, p)$ and the $(2, q)$ -torus links are isotopic if and only if $p = q$.

Exercise 6.3. [Hard] All 2-bridge knots have an alternating diagram. (Hint: as usual it is easier to work with 4-plat diagrams.)

Exercise 6.4. Check that, with the conventions given in class, the map $\pi: B_n \rightarrow S_n$ is an antihomomorphism. That is, $\pi(\sigma \cdot \tau) = \pi(\tau) \circ \pi(\sigma)$.

Exercise 6.5. For each knot K , up to six crossings, find a braid word σ_K so that K is isotopic to the braid closure of σ_K . Do this by orienting the knot, computing the Seifert circles, and resolving conflicts. (If you find another method let me know!) Compare the words you find with those found by other people in the class.

Exercise 6.6. Show that twice the braid index of a link is an upper bound for the bridge number. Show that this bound is not sharp.