HOMEWORK 7 (DUE APRIL 26)

Part 1: Pick and write up solutions for any 2 problems among the ones below.

1. Exercise 5 in XI.6 of Kassel's textbook.
2. Exercise 7 in XI.6 of Kassel's textbook.
3. Exercise 8 in XI.6 of Kassel's textbook.
4. Exercise 9 in XI.6 of Kassel's textbook.

Part 2: Pick and write up solutions for any 1 problem among the ones below.

5. Exercise 1 in X.7 of Kassel's textbook.

In other words, show that the center of the braid group B_n ($n > 2$) is an infinite cyclic group generated by $(\sigma_1 \dots \sigma_{n-1})^n$, and draw the corresponding element as a braid on n strands.

6. Exercise 5 in X.7 of Kassel's textbook.

To slightly reformulate the question, he is asking to show that if L and L' are diagrams connected by a Reidemeister transformation, and you use the Kauffmann bracket to write:

$$\langle L \rangle = x\langle L_0 \rangle + x^{-1}\langle L_\infty \rangle, \qquad \langle L' \rangle = x\langle L'_0 \rangle + x^{-1}\langle L'_\infty \rangle$$

(see X.8 of the textbook for the notation), then the link diagrams L_0 and L'_0 are also connected by Reidemeister transformations, as are L_∞ and L'_∞.

Part 3: Pick and write up solutions for any 1 problem among the ones below.

7. Exercise 1 in XII.6 of Kassel's textbook.
8. Exercise 3 in XII.6 of Kassel's textbook.