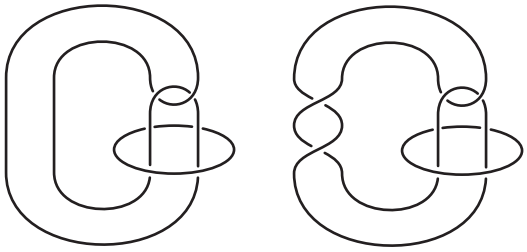
Math 9023 Homework 3

Due Thursday, 10/2/14

1. Prove that the links shown below have homeomorphic complements but distinct Jones polynomials. Hence, the Jones polynomial is not determined by the link complement.



2. Let L be a link of n components. Prove that the Jones polynomial evaluated at $q = 1$ is $J_L(1) = (-2)^{n-1}$.

3. Let K be a knot that admits a reduced alternating diagram with n crossings, where n is odd. Prove that K is not equivalent to its mirror image $\overline{K}$. Does the same conclusion hold for $K\#K$?

4. Prove that the braid group B_3 is isomorphic to the fundamental group of the trefoil complement.

5. Find a braid whose closure is the link on the right in the above picture.