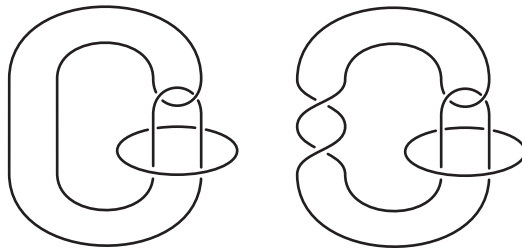


## Math 9023 Homework 3

Due Wednesday, 10/3/18

1. Compute the Alexander polynomial of the figure-8 knot, using a spanning surface and the Seifert form.
2. Compute the Jones polynomial of the figure-8 knot, using skein relations (i.e., without going through the bracket polynomial).
3. Prove that the links shown below have homeomorphic complements but distinct Jones polynomials. Hence, the Jones polynomial is not determined by the link complement.



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