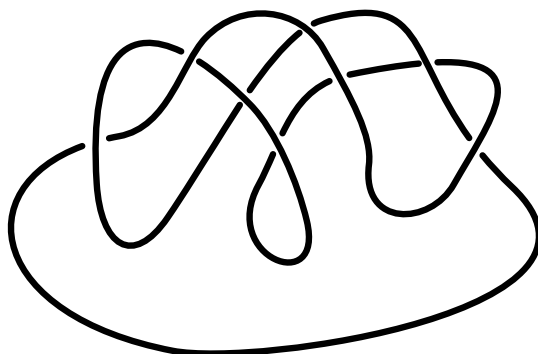


Math 309: Introduction to knot theory
Homework 4, due on Friday March 15 by 12:00 pm
(Submit your work at Room 219 of the Mathematics building)

1. (Adams, Exercise 6.14) Show that the Alexander polynomial of a splittable link is always 0.
2. (Adams, Exercise 4.22) Show that all twist knots have genus 1.
3. Show that the knot below is the figure eight knot, and then making use of the obvious orientable surface (as described in class) find the linking matrix (note that you need not appeal to Seifert's algorithm in this case).



Calculate the Alexander polynomial using this matrix, and check that it agrees with your calculation from Homework 3 (up to multiplication by some $\pm t^k$).

4. Calculate the HOMFLY polynomial for each of the three 6-crossing knots, and find the Alexander polynomial and the Jones polynomial in each case by specializing variables.
5. Apply Seifert's algorithm to find a surface associated with each of the three 6-crossing knots in that appendix of Adams. Calculate the genus in each case, and compare this value with the degree of the relevant Alexander polynomial.