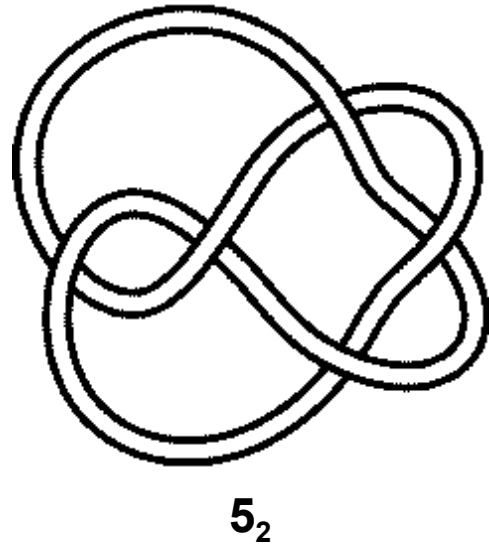


Surfaces and Genus

Andrews University // Anthony Bosman

1.

- (a) Draw the Seifert surface for the diagram of 5_2 depicted to the right.
- (b) Calculate the Euler characteristic of the surface. Use this to determine the genus of the surface, which is an upper bound for the genus of the knot.
- (c) Get a lower bound on the genus of the knot from the Alexander polynomial.
- (d) Determine the genus of the knot.



2. The family of twist knots is depicted below. Note that it includes the trefoil (one half twist) and the figure eight knot (two half twists). Show that every twist knot has genus 1.



3. Prove that there are infinitely many distinct knots. (Hint: construct an infinite family of knots that all have distinct genus.)