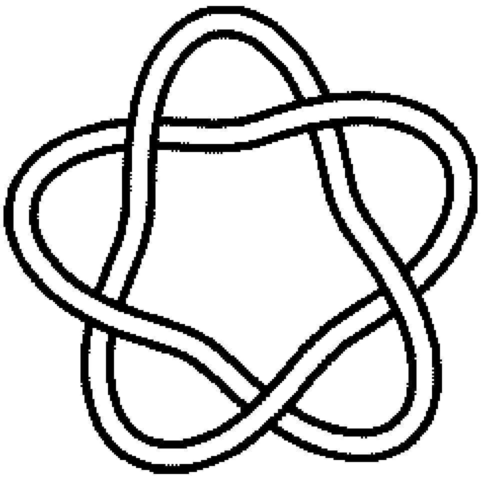
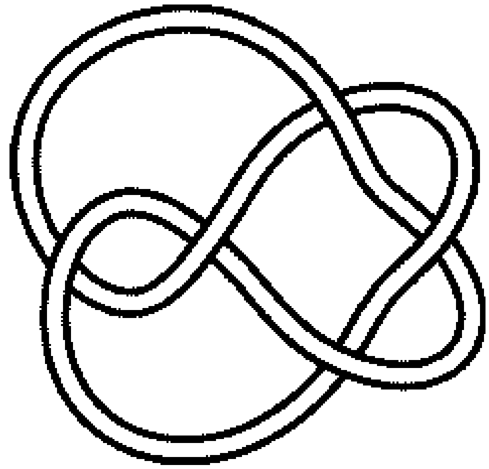
Alexander Polynomial of a Knot

Andrews University // Anthony Bosman

1. Calculate the Alexander polynomial for the following knots by determining the determinant of the matrix associated to the knot. Then calculate the determinant of the knot $\triangle_K(-1) = det(K)$ and verify $\triangle_K(1) = \pm 1$.



5_1

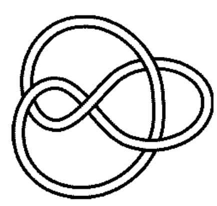


5_2

2. Calculate the Conway polynomial for the above knots using the skein relation $\nabla_{L_+} = \nabla_{L_-} - z\nabla_{L_0}$. Then verify for each knot that $\triangle_K(t) = \nabla_K(t^{1/2} - t^{-1/2})$ up to some multiple of $\pm t^m$.

3. (Optional) Verify the Reidemeister moves only change the Alexander polynomial up to some multiple of $\pm t^m$.

Correction: *In the lecture I incorrectly referred to the figure eight knot as* 5_1*; it should be labeled* 4_1 *as it can be drawn with only 4 crossings.*



4_1