ⓘ Info

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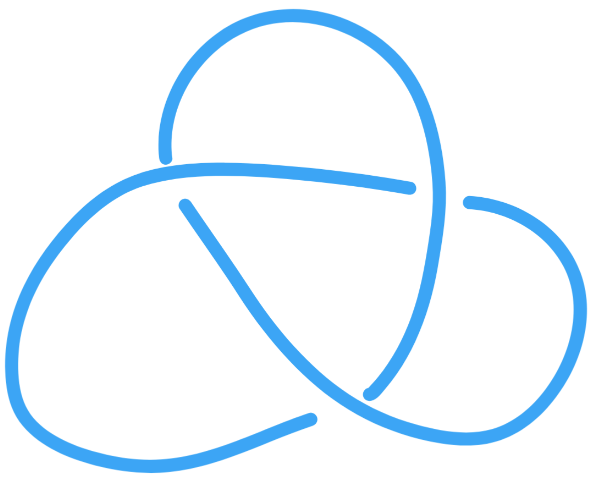
Trefoil 3_1 knot

Definition. Trefoil 3_1 knot



Alexander polymodal using Fox calculus on Wirtinger presentation

As a simple example of the way that this can be used, consider the Wirtinger presentation of the trefoil knot given by

$$G = \langle g_1, g_2, g_3;\ g_3 g_1 g_3^{-1} g_2^{-1},\ g_1 g_2 g_1^{-1} g_3^{-1} \rangle .$$

The formalism of the free differential calculus gives

$$\frac{\partial r_i}{\partial g_j} = \begin{pmatrix} g_3 & -g_3 g_1 g_3^{-1} g_2^{-1} & 1 - g_3 g_1 g_3^{-1} \\ 1 - g_1 g_2 g_1^{-1} & g_1 & -g_1 g_2 g_1^{-1} g_3^{-1} \end{pmatrix} .$$

On abelianising, each generator of the Wirtinger presentation is mapped to t, so

$$\alpha\phi\left(\frac{\partial r_i}{\partial g_j}\right) = \begin{pmatrix} t & -1 & 1-t \\ 1-t & t & -1 \end{pmatrix} .$$

Up to sign, all the (2×2) minors of this are $1 - t + t^2$, and so this is the Alexander polynomial of the trefoil knot. This general method of calculating the Alexander polynomial, when applied to a Wirtinger presentation, is essentially the "L-matrix" method of Reidemeister ([107] or [108]).

[1]

Current note has 0 direct children and 0 total descendants.

- stretchy
  - Trefoil 3_1 knot

And it has 62 siblings.

- stretchy
  - Trefoil 3_1 knot
  - The only compact connected Lie group that can act faithfully on a torus is itself
  - Hecke algebras
  - $\overline{B^n}$
  - $\mathrm{BS}(1,2)$
  - $(\mathbb{C}, +, \times)$
  - $D^* := D \setminus \{0\}$
  - Cantor set
  - Configuration space of N rigid points in $\mathbb{R}^3$
  - Free groups
  - $GL(2)(\mathbb{Z}) \curvearrowright T^2$
  - H_2^3
  - $[a, b]$
  - Figure 8 knot
  - Lamplighter group on $\mathbb{Z}_2$
  - $\beta\mathbb{N}$
  - $\#_2\mathbb{R}P^2$
  - $\prod_{i \in \mathbb{N}} \{1, \ldots, n_i\}$
  - $\mathbb{R}P^n$
  - $(\mathbb{Q}, +, \times, <)$
  - $\mathbb{Q}_p$
  - $\overline{\mathbb{Q}}$
  - $\mathbb{Q}_{\text{constr}}$
  - $\mathbb{Q}(\xi_n)$
  - $\mathcal{O}_{\overline{\mathbb{Q}}}$
  - $(\mathbb{R}, +, \times, <, \sup)$
  - Homeomorphism of $\mathbb{R}^2$ that sends $\mathbb{N}$ to a countable closed discrete subset
  - $\mathbb{R}^2 \times S^1$
  - $\mathbb{R}^n$
  - $\mathbb{R} \times S^1$
  - $\mathbb{R} \times S^2$
  - S^1

- $S^1 \wedge S^1$
- $S^1 \times S^n$
- S^2 and $\mathbb{C}\boldsymbol{P}^1$
- Mapping torus of the antipodal map of S^2
- S^3
- S^n
- I-bundle
- Symmetric group
- T
- T^2
- T_g^2
- $T_{0,0,3}^2$
- $\mathbb{R}^2 \setminus \{0\}$
- Three $T_{1,0,1}^2$ glued at their boundaries
- $T_{1,1,0}^2$
- T_2^2
- $T_g^2 \times [0,1]$
- $\#_{\mathbb{N}} T^2$
- Thompson's group
- T^n
- 3-valent tree
- 4-valent tree
- $[0,1]^{\mathbb{N}}$ with product topology
- Whitehead manifolds
- $\mathbb{Z}$
- $\mathbb{Z}[\sqrt{m}]$
- $\mathbb{Z}[X]$
- $\mathbb{Z}^{\mathbb{N}}$
- $\mathbb{Z}[i]$
- $\mathbb{Z}[i\sqrt{5}]$

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1. W.B.Raymond Lickorish - An Introduction to Knot Theory (Graduate Texts in Mathematics, 175)-Springer (2012).pdf > page=128 ↩