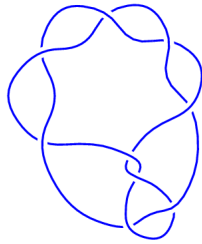
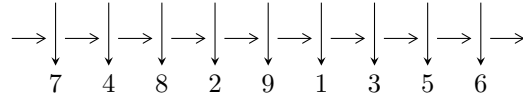


9₆ (K9a₂₃)

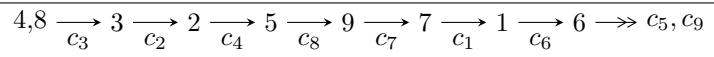


1

Arc Sequences



Solving Sequence



Representation Ideals

$$I = \bigcap_{i=1}^2 I_i^u$$

$$I_1^u = \langle u + 1 \rangle$$

$$I_2^u = \langle u^{12} - 2u^{10} - u^9 + 4u^8 + u^7 - 3u^6 - 3u^5 + 3u^4 + u^3 - u^2 - 2u + 1 \rangle$$

There are 2 irreducible components with 13 representations.

¹The knot diagram image is adapter from “C. Livingston and A. H. Moore, KnotInfo: Table of Knot Invariants, <http://www.indiana.edu/~knotinfo>”

$$\mathbf{I. } I_1^u = \langle u + 1 \rangle$$

(i) Arc colorings

$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} 1 \\ -1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -1 \\ -1 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes = -18

(iv) Complex Volumes and Cusp Shapes

Solution to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.00000$	-4.93480	-18.0000

$$\text{II. } I_2^u = \langle u^{12} - 2u^{10} - u^9 + 4u^8 + u^7 - 3u^6 - 3u^5 + 3u^4 + u^3 - u^2 - 2u + 1 \rangle$$

(i) Arc colorings

$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_3 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -u^2 + 1 \\ -u^2 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} u^4 - u^2 + 1 \\ u^4 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -u^9 + 2u^7 - 3u^5 + 2u^3 - u \\ -u^9 + u^7 - u^5 + u \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u \\ -u^3 + u \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -u^6 + u^4 - 2u^2 + 1 \\ u^8 - 2u^6 + 2u^4 - 2u^2 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -u^{11} + 2u^9 - 4u^7 + 4u^5 - 3u^3 + 2u \\ -u^{11} + u^{10} + u^9 - u^8 - 3u^7 + 3u^6 + u^5 - u^4 - 2u^3 + 2u^2 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -u^{11} + 2u^9 - 4u^7 + 4u^5 - 3u^3 + 2u \\ -u^{11} + u^{10} + u^9 - u^8 - 3u^7 + 3u^6 + u^5 - u^4 - 2u^3 + 2u^2 \end{pmatrix}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes = $4u^{11} - 8u^9 - 4u^8 + 12u^7 + 4u^6 - 8u^5 - 8u^4 + 4u^3 + 4u^2 - 4u - 14$

(iv) Complex Volumes and Cusp Shapes

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.075027 - 0.655125I$	$-10.34901 - 7.20360I$	$-14.0875 + 4.7166I$
$u = -1.075027 + 0.655125I$	$-10.34901 + 7.20360I$	$-14.0875 - 4.7166I$
$u = -0.850204 - 0.630914I$	$1.76919 - 2.46907I$	$-6.47747 + 3.95252I$
$u = -0.850204 + 0.630914I$	$1.76919 + 2.46907I$	$-6.47747 - 3.95252I$
$u = -0.511432 - 0.812623I$	$-8.67410 + 1.70959I$	$-11.87181 - 0.16720I$
$u = -0.511432 + 0.812623I$	$-8.67410 - 1.70959I$	$-11.87181 + 0.16720I$
$u = 0.470358$	-0.660692	-15.0692
$u = 0.635020 - 0.640255I$	$-0.207771 - 0.498503I$	$-10.63137 + 1.38008I$
$u = 0.635020 + 0.640255I$	$-0.207771 + 0.498503I$	$-10.63137 - 1.38008I$
$u = 0.985497 - 0.634576I$	$-1.23208 + 5.52285I$	$-12.56374 - 6.48307I$
$u = 0.985497 + 0.634576I$	$-1.23208 - 5.52285I$	$-12.56374 + 6.48307I$
$u = 1.16193$	-14.5896	-17.6671

III. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1, c_5, c_6 c_8, c_9	$(u - 1)(u^{12} + 2u^{11} + \dots + 4u + 1)$
c_2, c_4	$(u + 1)(u^{12} + 4u^{11} + \dots + 6u + 1)$
c_3, c_7	$(u + 1)(u^{12} - 2u^{10} + \dots - 2u + 1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_5, c_6 c_8, c_9	$(y - 1)(y^{12} - 16y^{11} + \dots - 6y + 1)$
c_2, c_4	$(y - 1)(y^{12} + 8y^{11} + \dots - 14y + 1)$
c_3, c_7	$(y - 1)(y^{12} - 4y^{11} + \dots - 6y + 1)$