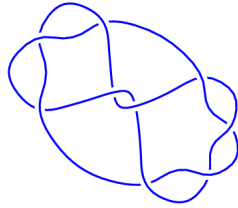
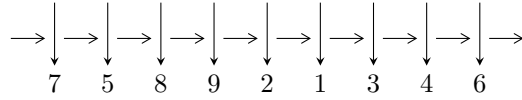


9₉ (K9a₃₃)

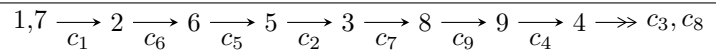


1

Arc Sequences



Solving Sequence



Representation Ideals

$$I = I_1^u$$

$$I_1^u = \langle u^{15} - u^{14} - 6u^{13} + 5u^{12} + 14u^{11} - 8u^{10} - 14u^9 + u^8 + 2u^7 + 8u^6 + 6u^5 - 4u^4 - 2u^3 - 2u^2 - 2u + 1 \rangle$$

There are 1 irreducible components with 15 representations.

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

$$\text{I. } I_1^u = \langle u^{15} - u^{14} - 6u^{13} + 5u^{12} + 14u^{11} - 8u^{10} - 14u^9 + u^8 + 2u^7 + 8u^6 + 6u^5 - 4u^4 - 2u^3 - 2u^2 - 2u + 1 \rangle$$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

$$a_6 = \begin{pmatrix} u \\ u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -u^3 + 2u \\ -u^5 + u^3 + u \end{pmatrix}$$

$$a_3 = \begin{pmatrix} u^6 - 3u^4 + 2u^2 + 1 \\ u^8 - 2u^6 + 2u^2 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -u^{13} + 6u^{11} - 13u^9 + 10u^7 + 2u^5 - 4u^3 - u \\ -u^{14} - u^{13} + \dots - u + 1 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -u^2 + 1 \\ -u^2 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u^9 + 4u^7 - 5u^5 + 3u \\ -u^9 + 3u^7 - 3u^5 + u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u^9 + 4u^7 - 5u^5 + 3u \\ -u^9 + 3u^7 - 3u^5 + u \end{pmatrix}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes

$$= -4u^{12} + 20u^{10} + 4u^9 - 36u^8 - 16u^7 + 20u^6 + 20u^5 + 12u^4 - 4u^3 - 12u^2 - 4u - 14$$

(iv) Complex Volumes and Cusp Shapes

Solution to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.314203 - 0.295245I$	$-2.18329 - 5.45324I$	$-11.99532 + 6.35130I$
$u = -1.314203 + 0.295245I$	$-2.18329 + 5.45324I$	$-11.99532 - 6.35130I$
$u = -1.30332$	-5.52548	-17.0394
$u = -0.897290 - 0.288232I$	$-6.76384 + 0.15908I$	$-13.79403 + 0.85194I$
$u = -0.897290 + 0.288232I$	$-6.76384 - 0.15908I$	$-13.79403 - 0.85194I$
$u = -0.200931 - 0.760138I$	$-4.52273 - 4.11725I$	$-10.59688 + 3.71929I$
$u = -0.200931 + 0.760138I$	$-4.52273 + 4.11725I$	$-10.59688 - 3.71929I$
$u = 0.074720 - 0.708028I$	$2.17425 + 1.81248I$	$-6.14381 - 4.33913I$
$u = 0.074720 + 0.708028I$	$2.17425 - 1.81248I$	$-6.14381 + 4.33913I$
$u = 0.339181$	-0.597930	-16.6282
$u = 1.224706 - 0.250895I$	$-1.29895 + 1.64925I$	$-9.60633 - 0.16522I$
$u = 1.224706 + 0.250895I$	$-1.29895 - 1.64925I$	$-9.60633 + 0.16522I$
$u = 1.378138 - 0.316043I$	$-9.51895 + 8.01682I$	$-15.0413 - 4.8968I$
$u = 1.378138 + 0.316043I$	$-9.51895 - 8.01682I$	$-15.0413 + 4.8968I$
$u = 1.43385$	-13.8020	-17.9771

II. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1, c_6, c_9	$(u^{15} + u^{14} + \dots - 2u - 1)$
c_2, c_5	$(u^{15} + 3u^{14} + \dots - 4u^2 + 1)$
c_3, c_4, c_7 c_8	$(u^{15} + u^{14} + \dots - 2u + 1)$

III. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_6, c_9	$(y^{15} - 13y^{14} + \dots + 8y - 1)$
c_2, c_5	$(y^{15} + 7y^{14} + \dots + 8y - 1)$
c_3, c_4, c_7 c_8	$(y^{15} - 17y^{14} + \dots + 8y - 1)$