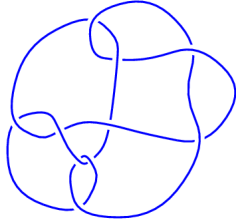
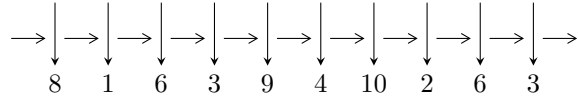


10₁₃₄ (K10n₆)

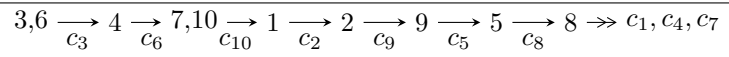


1

Arc Sequences



Solving Sequence



Representation Ideals

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

$$I_1^u = \langle b^3 + b^2 + 2b + 1, a, u - 1 \rangle$$

$$I_2^u = \langle u^{14} + 4u^{13} - 2u^{12} - 21u^{11} + 2u^{10} + 53u^9 - 13u^8 - 77u^7 + 38u^6 + 57u^5 - 37u^4 - 9u^3 + 12u^2 + u - 1, \\ 3u^{13} + 9u^{12} + \dots + 2a - 1, 7u^{13} + 19u^{12} + \dots + 4b - 9 \rangle$$

There are 2 irreducible components with 17 representations.

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

$$\text{I. } I_1^u = \langle b^3 + b^2 + 2b + 1, a, u - 1 \rangle$$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

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

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

$$a_{10} = \begin{pmatrix} 0 \\ b \end{pmatrix}$$

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

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

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

$$a_5 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -1 \\ -b^2 \end{pmatrix}$$

(ii) Obstruction class = 1

(iii) Cusp Shapes = $-b^2 - 3b - 15$

(iv) Complex Volumes and Cusp Shapes

Solution to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.00000$ $a = 0$ $b = -0.569840$	-2.75839	-13.6152
$u = 1.00000$ $a = 0$ $b = -0.215080 - 1.307141I$	$1.37919 - 2.82812I$	$-12.69240 + 3.35914I$
$u = 1.00000$ $a = 0$ $b = -0.215080 + 1.307141I$	$1.37919 + 2.82812I$	$-12.69240 - 3.35914I$

II.

$$I_2^u = \langle u^{14} + 4u^{13} + \dots + u - 1, 3u^{13} + 9u^{12} + \dots + 2a - 1, 7u^{13} + 19u^{12} + \dots + 4b - 9 \rangle$$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

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

$$a_{10} = \begin{pmatrix} -\frac{3}{2}u^{13} - \frac{9}{2}u^{12} + \dots - 8u + \frac{1}{2} \\ -\frac{7}{4}u^{13} - \frac{19}{4}u^{12} + \dots - 5u + \frac{9}{4} \end{pmatrix}$$

$$a_1 = \begin{pmatrix} \frac{1}{4}u^{13} + \frac{1}{4}u^{12} + \dots - 3u - \frac{7}{4} \\ -\frac{7}{4}u^{13} - \frac{19}{4}u^{12} + \dots - 5u + \frac{9}{4} \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -\frac{1}{4}u^{13} - \frac{3}{4}u^{12} + \dots - \frac{3}{2}u + \frac{9}{4} \\ \frac{1}{4}u^{13} + \frac{3}{4}u^{12} + \dots - \frac{1}{2}u - \frac{1}{4} \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -\frac{3}{2}u^{13} - \frac{9}{2}u^{12} + \dots - 8u + \frac{1}{2} \\ \frac{3}{4}u^{13} + \frac{3}{4}u^{12} + \dots - 2u + \frac{3}{4} \end{pmatrix}$$

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

$$a_8 = \begin{pmatrix} -1 \\ -\frac{1}{4}u^{13} - \frac{3}{4}u^{12} + \dots + \frac{3}{2}u + \frac{1}{4} \end{pmatrix}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes = $-2u^{13} - \frac{17}{2}u^{12} + 4u^{11} + \frac{93}{2}u^{10} - \frac{11}{2}u^9 - \frac{241}{2}u^8 + 38u^7 + 172u^6 - \frac{215}{2}u^5 - 113u^4 + 102u^3 - \frac{1}{2}u^2 - \frac{51}{2}u - \frac{13}{2}$

(iv) Complex Volumes and Cusp Shapes

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.87660$ $a = 1.15919$ $b = 1.60066$	-15.8216	-16.2411
$u = -1.77359 - 0.25173I$ $a = 1.114823 + 0.148082I$ $b = 0.82970 + 1.55473I$	-11.19678 - 8.39292I	-13.3988 + 4.5885I
$u = -1.77359 + 0.25173I$ $a = 1.114823 - 0.148082I$ $b = 0.82970 - 1.55473I$	-11.19678 + 8.39292I	-13.3988 - 4.5885I
$u = -1.72923 - 0.15134I$ $a = -1.078917 - 0.093411I$ $b = -0.629782 - 0.920041I$	-9.20540 - 2.45847I	-11.50081 + 0.42962I
$u = -1.72923 + 0.15134I$ $a = -1.078917 + 0.093411I$ $b = -0.629782 + 0.920041I$	-9.20540 + 2.45847I	-11.50081 - 0.42962I
$u = -0.412302 - 0.084821I$ $a = -0.201506 - 1.398294I$ $b = 0.267015 - 1.222640I$	2.37413 + 2.69540I	-3.68064 - 2.88879I
$u = -0.412302 + 0.084821I$ $a = -0.201506 + 1.398294I$ $b = 0.267015 + 1.222640I$	2.37413 - 2.69540I	-3.68064 + 2.88879I
$u = 0.303096$ $a = -1.73095$ $b = 0.243596$	-0.780136	-12.5295
$u = 0.517778 - 0.426572I$ $a = -1.035788 - 0.663451I$ $b = 0.134884 + 0.480979I$	-0.660151 + 0.090610I	-10.51478 - 0.23122I
$u = 0.517778 + 0.426572I$ $a = -1.035788 + 0.663451I$ $b = 0.134884 - 0.480979I$	-0.660151 - 0.090610I	-10.51478 + 0.23122I

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.879051 - 0.720119I$	$-1.98336 + 4.24963I$	$-13.14655 - 5.18533I$
$a = 0.739858 + 0.863536I$		
$b = 0.731209 - 1.048473I$		
$u = 0.879051 + 0.720119I$	$-1.98336 - 4.24963I$	$-13.14655 + 5.18533I$
$a = 0.739858 - 0.863536I$		
$b = 0.731209 + 1.048473I$		
$u = 1.305049 - 0.250183I$	$-3.10381 - 1.41191I$	$-13.8732 + 3.8151I$
$a = 0.247411 + 0.791940I$		
$b = 0.744850 + 0.696808I$		
$u = 1.305049 + 0.250183I$	$-3.10381 + 1.41191I$	$-13.8732 - 3.8151I$
$a = 0.247411 - 0.791940I$		
$b = 0.744850 - 0.696808I$		

III. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1	$(u^3 - u^2 + 1)(u^{14} + 2u^{13} + \dots - 4u - 1)$
c_2	$(u^3 + u^2 + 2u + 1)(u^{14} + 6u^{13} + \dots + 8u + 1)$
c_3	$(u - 1)^3(u^{14} + 4u^{13} + \dots + u - 1)$
c_4	$(u + 1)^3(u^{14} + 20u^{13} + \dots + 25u + 1)$
c_5, c_9	$u^3(u^{14} + u^{13} + \dots + 20u + 8)$
c_6	$(u + 1)^3(u^{14} + 4u^{13} + \dots + u - 1)$
c_7	$(u^3 - u^2 + 2u - 1)(u^{14} + 2u^{13} + \dots + 2u - 1)$
c_8	$(u^3 + u^2 - 1)(u^{14} + 2u^{13} + \dots - 4u - 1)$
c_{10}	$(u^3 - u^2 + 2u - 1)(u^{14} + 6u^{13} + \dots + 8u + 1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_8	$(y^3 - y^2 + 2y - 1)(y^{14} - 6y^{13} + \dots - 8y + 1)$
c_2, c_{10}	$(y^3 + 3y^2 + 2y - 1)(y^{14} + 6y^{13} + \dots - 8y + 1)$
c_3, c_6	$(y - 1)^3(y^{14} - 20y^{13} + \dots - 25y + 1)$
c_4	$(y - 1)^3(y^{14} - 48y^{13} + \dots - 153y + 1)$
c_5, c_9	$y^3(y^{14} - 21y^{13} + \dots - 144y + 64)$
c_7	$(y^3 + 3y^2 + 2y - 1)(y^{14} - 30y^{13} + \dots - 8y + 1)$