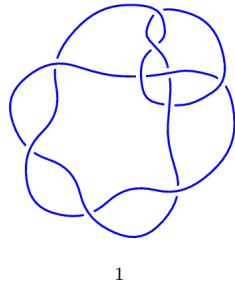
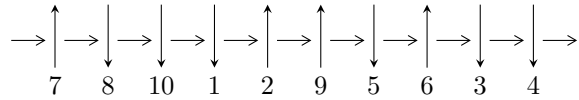


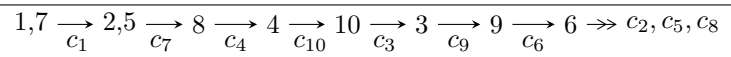
10₈₂ (K10a₈₃)



Arc Sequences



Solving Sequence



Representation Ideals

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

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

$$I_2^u = \langle u^{32} - 2u^{31} + \dots + u + 1, \\ - 1796669401u^{31} + 1802524431u^{30} + \dots + 15215838414a + 29808471797, \\ 9543021035u^{31} - 15574254375u^{30} + \dots + 7607919207b - 15574499611 \rangle$$

There are 2 irreducible components with 33 representations.

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

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

(i) Arc colorings

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

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

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

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

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

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

$$a_{10} = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$

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

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

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

(ii) Obstruction class = 1

(iii) Cusp Shapes = 0

(iv) Complex Volumes and Cusp Shapes

Solution to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.00000$		
$a = 0$	0	0
$b = -1.00000$		

II.

$$I_2^u = \langle u^{32} - 2u^{31} + \dots + u + 1, -1.80 \times 10^9 u^{31} + 1.80 \times 10^9 u^{30} + \dots + 1.52 \times 10^{10} a + 2.98 \times 10^{10}, 9.54 \times 10^9 u^{31} - 1.56 \times 10^{10} u^{30} + \dots + 7.61 \times 10^9 b - 1.56 \times 10^{10} \rangle$$

(i) Arc colorings

$$\begin{aligned} a_1 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_7 &= \begin{pmatrix} 0.118079u^{31} - 0.118464u^{30} + \dots + 0.412685u - 1.95904 \\ -1.25435u^{31} + 2.04711u^{30} + \dots + 8.05367u + 2.04714 \end{pmatrix} \\ a_2 &= \begin{pmatrix} -0.999382u^{31} + 1.00005u^{30} + \dots + 3.56630u + 0.283430 \\ 1.42658u^{31} - 2.23424u^{30} + \dots - 1.94251u - 2.22835 \end{pmatrix} \\ a_5 &= \begin{pmatrix} 0 \\ u \end{pmatrix} \\ a_8 &= \begin{pmatrix} 0.118079u^{31} - 0.118464u^{30} + \dots + 0.412685u - 1.95904 \\ -1.21967u^{31} + 1.92903u^{30} + \dots + 7.81790u + 1.92945 \end{pmatrix} \\ a_4 &= \begin{pmatrix} u \\ u \end{pmatrix} \\ a_{10} &= \begin{pmatrix} -u^2 + 1 \\ -u^2 \end{pmatrix} \\ a_3 &= \begin{pmatrix} -u^3 + 2u \\ -u^3 + u \end{pmatrix} \\ a_9 &= \begin{pmatrix} u^4 - 3u^2 + 1 \\ u^4 - 2u^2 \end{pmatrix} \\ a_6 &= \begin{pmatrix} -u^4 + 3u^2 - 1 \\ -1.40694u^{31} + 2.22362u^{30} + \dots + 8.44715u + 2.22354 \end{pmatrix} \end{aligned}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes = $-\frac{18210579048}{2535973069}u^{31} + \frac{32359838926}{2535973069}u^{30} + \dots + \frac{94883406442}{2535973069}u + \frac{41946667180}{2535973069}$

(iv) Complex Volumes and Cusp Shapes

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.67671 - 0.06666I$ $a = -0.536466 - 0.098385I$ $b = -0.654826 + 0.660177I$	$-10.51010 - 0.53898I$	$-8.46673 - 2.10572I$
$u = -1.67671 + 0.06666I$ $a = -0.536466 + 0.098385I$ $b = -0.654826 - 0.660177I$	$-10.51010 + 0.53898I$	$-8.46673 + 2.10572I$
$u = -1.61612 - 0.17777I$ $a = 0.632286 + 0.201988I$ $b = 0.306209 - 1.201451I$	$-8.99388 - 4.78654I$	$-6.99769 + 4.71106I$
$u = -1.61612 + 0.17777I$ $a = 0.632286 - 0.201988I$ $b = 0.306209 + 1.201451I$	$-8.99388 + 4.78654I$	$-6.99769 - 4.71106I$
$u = -1.60015 - 0.02565I$ $a = 0.221331 - 0.375842I$ $b = 0.70363 + 2.68902I$	$-7.09081 - 0.79638I$	$-8.17185 - 8.18456I$
$u = -1.60015 + 0.02565I$ $a = 0.221331 + 0.375842I$ $b = 0.70363 - 2.68902I$	$-7.09081 + 0.79638I$	$-8.17185 + 8.18456I$
$u = -0.820983 - 0.567595I$ $a = -1.381692 - 0.080236I$ $b = -0.98755 + 1.10218I$	$0.60537 - 9.61260I$	$-2.87987 + 8.20248I$
$u = -0.820983 + 0.567595I$ $a = -1.381692 + 0.080236I$ $b = -0.98755 - 1.10218I$	$0.60537 + 9.61260I$	$-2.87987 - 8.20248I$
$u = -0.795955 - 0.349102I$ $a = 1.58365 + 0.35537I$ $b = 0.685271 - 0.866968I$	$-2.75563 - 4.13382I$	$-6.93448 + 6.73749I$
$u = -0.795955 + 0.349102I$ $a = 1.58365 - 0.35537I$ $b = 0.685271 + 0.866968I$	$-2.75563 + 4.13382I$	$-6.93448 - 6.73749I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.560858 - 0.310184I$ $a = -0.04973 + 2.07642I$ $b = 0.448395 - 0.126836I$	$1.86601 - 2.61443I$	$0.82365 + 8.13996I$
$u = -0.560858 + 0.310184I$ $a = -0.04973 - 2.07642I$ $b = 0.448395 + 0.126836I$	$1.86601 + 2.61443I$	$0.82365 - 8.13996I$
$u = -0.269938 - 0.288721I$ $a = -2.38342 + 0.84703I$ $b = -1.008544 + 0.055119I$	$2.64104 + 0.25879I$	$3.85203 + 2.96045I$
$u = -0.269938 + 0.288721I$ $a = -2.38342 - 0.84703I$ $b = -1.008544 - 0.055119I$	$2.64104 - 0.25879I$	$3.85203 - 2.96045I$
$u = -0.102445 - 0.771273I$ $a = 0.732522 + 1.203864I$ $b = 0.760666 + 0.764334I$	$2.78249 + 5.16401I$	$0.17525 - 5.43243I$
$u = -0.102445 + 0.771273I$ $a = 0.732522 - 1.203864I$ $b = 0.760666 - 0.764334I$	$2.78249 - 5.16401I$	$0.17525 + 5.43243I$
$u = 0.086458 - 0.449548I$ $a = -1.40221 - 1.08937I$ $b = -0.327058 - 0.712943I$	$-0.227616 + 1.394369I$	$-2.60146 - 4.04487I$
$u = 0.086458 + 0.449548I$ $a = -1.40221 + 1.08937I$ $b = -0.327058 + 0.712943I$	$-0.227616 - 1.394369I$	$-2.60146 + 4.04487I$
$u = 0.598750 - 0.114970I$ $a = -0.106728 - 0.622053I$ $b = 0.40414 + 2.50188I$	$0.576409 + 0.313871I$	$8.1378 + 17.1065I$
$u = 0.598750 + 0.114970I$ $a = -0.106728 + 0.622053I$ $b = 0.40414 - 2.50188I$	$0.576409 - 0.313871I$	$8.1378 - 17.1065I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.643643 - 0.579820I$ $a = -0.735849 - 0.491532I$ $b = -0.069756 - 0.917675I$	$-1.27204 + 1.92248I$	$-7.80216 - 5.91516I$
$u = 0.643643 + 0.579820I$ $a = -0.735849 + 0.491532I$ $b = -0.069756 + 0.917675I$	$-1.27204 - 1.92248I$	$-7.80216 + 5.91516I$
$u = 0.788048$ $a = 0.423528$ $b = 0.523396$	-1.36694	-7.37901
$u = 1.076155 - 0.444148I$ $a = 0.444604 + 0.479356I$ $b = -0.282418 + 0.474577I$	$-0.800175 - 0.941991I$	$-6.40540 + 5.25085I$
$u = 1.076155 + 0.444148I$ $a = 0.444604 - 0.479356I$ $b = -0.282418 - 0.474577I$	$-0.800175 + 0.941991I$	$-6.40540 - 5.25085I$
$u = 1.55208$ $a = 1.13958$ $b = 1.33607$	-3.73390	0.293662
$u = 1.57850 - 0.06009I$ $a = 0.318476 + 1.091374I$ $b = -0.083790 - 0.485002I$	$-5.46664 + 3.81790I$	$-2.30098 - 5.52630I$
$u = 1.57850 + 0.06009I$ $a = 0.318476 - 1.091374I$ $b = -0.083790 + 0.485002I$	$-5.46664 - 3.81790I$	$-2.30098 + 5.52630I$
$u = 1.63927 - 0.09770I$ $a = -0.955274 + 0.519291I$ $b = -0.95326 - 1.04581I$	$-11.15787 + 5.83644I$	$-7.71930 - 4.74826I$
$u = 1.63927 + 0.09770I$ $a = -0.955274 - 0.519291I$ $b = -0.95326 + 1.04581I$	$-11.15787 - 5.83644I$	$-7.71930 + 4.74826I$
Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.65031 - 0.16673I$ $a = 0.836945 - 0.484675I$ $b = 1.12916 + 1.41089I$	$-7.8166 + 12.4315I$	$-5.16615 - 6.75497I$
$u = 1.65031 + 0.16673I$ $a = 0.836945 + 0.484675I$ $b = 1.12916 - 1.41089I$	$-7.8166 - 12.4315I$	$-5.16615 + 6.75497I$

III. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1	$(u + 1)(u^{32} + 2u^{31} + \dots + 12u + 8)$
c_2	$(u + 1)(u^{32} + 11u^{30} + \dots - 13u - 1)$
c_3, c_4	$(u + 1)(u^{32} + 2u^{31} + \dots - u + 1)$
c_5	$(u + 1)(u^{32} + 2u^{31} + \dots - u - 1)$
c_6	$(u + 1)(u^{32} + 2u^{31} + \dots - 13u - 1)$
c_7	$(u)(u^{32} + 5u^{31} + \dots + 6u + 2)$
c_8	$(u - 1)(u^{32} + 2u^{31} + \dots - 13u - 1)$
c_9, c_{10}	$(u - 1)(u^{32} + 2u^{31} + \dots - u + 1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1	$(y - 1)(y^{32} + 30y^{31} + \dots + 240y + 64)$
c_2	$(y - 1)(y^{32} + 22y^{31} + \dots - 121y + 1)$
c_3, c_4, c_9 c_{10}	$(y - 1)(y^{32} - 38y^{31} + \dots - 5y + 1)$
c_5	$(y - 1)(y^{32} - 6y^{31} + \dots - 5y + 1)$
c_6, c_8	$(y - 1)(y^{32} - 18y^{31} + \dots - 81y + 1)$
c_7	$(y)(y^{32} - 9y^{31} + \dots - 32y + 4)$