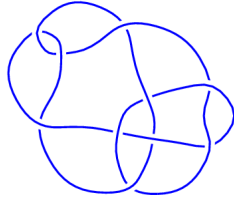
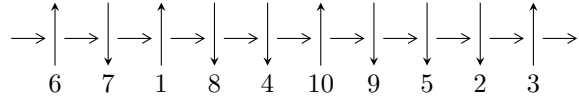


10₈₇ (K10a₃₉)

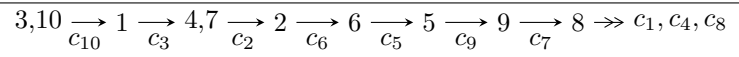


1

Arc Sequences



Solving Sequence



Representation Ideals

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

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

$$I_2^u = \langle u^{41} - 2u^{40} + \dots - 97u - 29, \\ - 2.36615 \times 10^{84}u^{40} + 1.00102 \times 10^{85}u^{39} + \dots + 2.02004 \times 10^{85}b - 2.22392 \times 10^{86}, \\ 1.45715 \times 10^{86}u^{40} - 2.37849 \times 10^{86}u^{39} + \dots + 5.85812 \times 10^{86}a - 2.22717 \times 10^{87} \rangle$$

There are 2 irreducible components with 42 representations.

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

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

(i) Arc colorings

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

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

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

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

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

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

$$a_6 = \begin{pmatrix} -1 \\ 2 \end{pmatrix}$$

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

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

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

(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
$u = 1.00000$		
$a = -1.00000$	0	0
$b = 1.00000$		

$$\text{II. } I_2^u = \langle u^{41} - 2u^{40} + \dots - 97u - 29, -2.37 \times 10^{84}u^{40} + 1.00 \times 10^{85}u^{39} + \dots + 2.02 \times 10^{85}b - 2.22 \times 10^{86}, 1.46 \times 10^{86}u^{40} - 2.38 \times 10^{86}u^{39} + \dots + 5.86 \times 10^{86}a - 2.23 \times 10^{87} \rangle$$

(i) Arc colorings

$$\begin{aligned} a_3 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_{10} &= \begin{pmatrix} -0.248740u^{40} + 0.406016u^{39} + \dots + 16.6441u + 3.80185 \\ 0.117134u^{40} - 0.495543u^{39} + \dots + 29.0009u + 11.0093 \end{pmatrix} \\ a_1 &= \begin{pmatrix} -0.131606u^{40} - 0.0895269u^{39} + \dots + 45.6450u + 14.8111 \\ 0.117134u^{40} - 0.495543u^{39} + \dots + 29.0009u + 11.0093 \end{pmatrix} \\ a_4 &= \begin{pmatrix} -0.292917u^{40} + 0.513744u^{39} + \dots + 23.4665u + 3.07201 \\ -0.480424u^{40} + 1.12971u^{39} + \dots - 3.94821u - 8.19114 \end{pmatrix} \\ a_7 &= \begin{pmatrix} 0 \\ u \end{pmatrix} \\ a_2 &= \begin{pmatrix} 1 \\ -u^2 \end{pmatrix} \\ a_6 &= \begin{pmatrix} -0.309265u^{40} + 0.667402u^{39} + \dots + 12.5382u - 3.04639 \\ -0.240957u^{40} + 0.384787u^{39} + \dots + 29.4513u + 5.43770 \end{pmatrix} \\ a_5 &= \begin{pmatrix} 0.461677u^{40} - 0.955241u^{39} + \dots - 39.4863u - 7.28846 \\ 0.488568u^{40} - 0.687641u^{39} + \dots - 84.2115u - 18.9283 \end{pmatrix} \\ a_9 &= \begin{pmatrix} 0.0853670u^{40} - 0.467864u^{39} + \dots + 29.5596u + 12.1587 \\ 0.283335u^{40} - 0.962531u^{39} + \dots + 39.2615u + 16.9736 \end{pmatrix} \\ a_8 &= \begin{pmatrix} -0.0783018u^{40} + 0.335178u^{39} + \dots - 27.0594u - 10.5696 \\ 0.259788u^{40} - 0.136631u^{39} + \dots - 77.8718u - 19.5569 \end{pmatrix} \end{aligned}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes = $-0.964869u^{40} + 2.21650u^{39} + \dots + 15.7583u - 11.1379$

(iv) Complex Volumes and Cusp Shapes

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.84706 - 1.39224I$ $a = -0.155159 - 0.941463I$ $b = -1.45266 + 0.46932I$	$9.17940 - 7.97252I$	$3.27060 + 3.71618I$
$u = -0.84706 + 1.39224I$ $a = -0.155159 + 0.941463I$ $b = -1.45266 - 0.46932I$	$9.17940 + 7.97252I$	$3.27060 - 3.71618I$
$u = -0.817889 - 1.149023I$ $a = 0.493407 - 0.092769I$ $b = 0.335334 - 0.324976I$	$3.49362 + 1.78935I$	$0.87448 - 4.34492I$
$u = -0.817889 + 1.149023I$ $a = 0.493407 + 0.092769I$ $b = 0.335334 + 0.324976I$	$3.49362 - 1.78935I$	$0.87448 + 4.34492I$
$u = -0.803428 - 0.914535I$ $a = -0.020946 + 0.842025I$ $b = 0.163245 - 1.244783I$	$3.27367 - 8.18385I$	$0.29544 + 8.35233I$
$u = -0.803428 + 0.914535I$ $a = -0.020946 - 0.842025I$ $b = 0.163245 + 1.244783I$	$3.27367 + 8.18385I$	$0.29544 - 8.35233I$
$u = -0.676854 - 0.607503I$ $a = -0.007234 + 1.105057I$ $b = -0.096162 - 0.914015I$	$-2.78156 - 3.84619I$	$-6.97849 + 6.75687I$
$u = -0.676854 + 0.607503I$ $a = -0.007234 - 1.105057I$ $b = -0.096162 + 0.914015I$	$-2.78156 + 3.84619I$	$-6.97849 - 6.75687I$
$u = -0.616531 - 1.004935I$ $a = -0.178036 - 1.400954I$ $b = -1.284695 + 0.271028I$	$4.36449 - 4.62926I$	$4.68493 + 4.91932I$
$u = -0.616531 + 1.004935I$ $a = -0.178036 + 1.400954I$ $b = -1.284695 - 0.271028I$	$4.36449 + 4.62926I$	$4.68493 - 4.91932I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.552035 - 0.294297I$		
$a = -0.842537 + 0.587546I$	$2.56290 - 0.10225I$	$4.38337 - 2.22967I$
$b = 1.275178 - 0.127224I$		
$u = -0.552035 + 0.294297I$		
$a = -0.842537 - 0.587546I$	$2.56290 + 0.10225I$	$4.38337 + 2.22967I$
$b = 1.275178 + 0.127224I$		
$u = -0.348292 - 0.221145I$		
$a = 0.34967 + 2.50510I$	$-1.94008 + 1.34771I$	$-7.61480 - 3.42502I$
$b = -0.408078 - 0.420450I$		
$u = -0.348292 + 0.221145I$		
$a = 0.34967 - 2.50510I$	$-1.94008 - 1.34771I$	$-7.61480 + 3.42502I$
$b = -0.408078 + 0.420450I$		
$u = -0.112780 - 0.808744I$		
$a = -1.80140 + 1.14585I$	$7.57848 - 5.87702I$	$4.98103 + 5.65225I$
$b = -1.277529 + 0.155370I$		
$u = -0.112780 + 0.808744I$		
$a = -1.80140 - 1.14585I$	$7.57848 + 5.87702I$	$4.98103 - 5.65225I$
$b = -1.277529 - 0.155370I$		
$u = -0.052118 - 0.819445I$		
$a = 0.328066 - 0.998011I$	$7.62795 + 5.14257I$	$6.43416 - 5.95767I$
$b = 1.55855 + 0.65970I$		
$u = -0.052118 + 0.819445I$		
$a = 0.328066 + 0.998011I$	$7.62795 - 5.14257I$	$6.43416 + 5.95767I$
$b = 1.55855 - 0.65970I$		
$u = -0.016292 - 0.887375I$		
$a = -1.42252 - 1.37633I$	$8.52020 - 0.56768I$	$6.81847 + 0.32338I$
$b = -1.310630 - 0.070763I$		
$u = -0.016292 + 0.887375I$		
$a = -1.42252 + 1.37633I$	$8.52020 + 0.56768I$	$6.81847 - 0.32338I$
$b = -1.310630 + 0.070763I$		

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.00877 - 3.29065I$		
$a = 0.157549 - 0.007328I$	$5.18095 - 2.90757I$	$-15.8800 + 0.0973I$
$b = 1.134146 - 0.025263I$		
$u = -0.00877 + 3.29065I$		
$a = 0.157549 + 0.007328I$	$5.18095 + 2.90757I$	$-15.8800 - 0.0973I$
$b = 1.134146 + 0.025263I$		
$u = 0.083569 - 0.725138I$		
$a = 0.386389 + 1.105088I$	$7.77351 + 0.87153I$	$6.95024 + 0.30904I$
$b = 1.60494 - 0.57469I$		
$u = 0.083569 + 0.725138I$		
$a = 0.386389 - 1.105088I$	$7.77351 - 0.87153I$	$6.95024 - 0.30904I$
$b = 1.60494 + 0.57469I$		
$u = 0.350374 - 0.701645I$		
$a = 0.404942 - 0.966845I$	$0.05414 + 1.50218I$	$0.18723 - 4.24532I$
$b = 0.142705 + 0.550416I$		
$u = 0.350374 + 0.701645I$		
$a = 0.404942 + 0.966845I$	$0.05414 - 1.50218I$	$0.18723 + 4.24532I$
$b = 0.142705 - 0.550416I$		
$u = 0.358882 - 0.899587I$		
$a = 0.025505 - 0.769488I$	$1.56831 + 2.54987I$	$1.57226 - 7.77175I$
$b = 1.072998 + 0.545709I$		
$u = 0.358882 + 0.899587I$		
$a = 0.025505 + 0.769488I$	$1.56831 - 2.54987I$	$1.57226 + 7.77175I$
$b = 1.072998 - 0.545709I$		
$u = 0.519866 - 0.633729I$		
$a = 0.18225 + 2.28261I$	$0.067811 + 0.953358I$	$2.02910 - 7.42558I$
$b = -1.116563 - 0.153454I$		
$u = 0.519866 + 0.633729I$		
$a = 0.18225 - 2.28261I$	$0.067811 - 0.953358I$	$2.02910 + 7.42558I$
$b = -1.116563 + 0.153454I$		

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.662740$ $a = 0.845831$ $b = -0.0835204$	-1.43130	-6.87204
$u = 0.66708 - 2.46190I$ $a = 0.107052 - 0.134257I$ $b = 0.938830 - 0.044980I$	$0.431185 - 0.284475I$	$13.1815 - 15.1990I$
$u = 0.66708 + 2.46190I$ $a = 0.107052 + 0.134257I$ $b = 0.938830 + 0.044980I$	$0.431185 + 0.284475I$	$13.1815 + 15.1990I$
$u = 0.726138 - 0.952037I$ $a = 0.023496 - 0.831457I$ $b = 0.265202 + 1.192169I$	$3.76974 + 2.25598I$	$1.50138 - 3.41744I$
$u = 0.726138 + 0.952037I$ $a = 0.023496 + 0.831457I$ $b = 0.265202 - 1.192169I$	$3.76974 - 2.25598I$	$1.50138 + 3.41744I$
$u = 0.897003 - 1.048182I$ $a = 0.059395 + 1.136795I$ $b = -1.253449 - 0.430907I$	$0.85372 + 8.63849I$	$-1.84811 - 8.19635I$
$u = 0.897003 + 1.048182I$ $a = 0.059395 - 1.136795I$ $b = -1.253449 + 0.430907I$	$0.85372 - 8.63849I$	$-1.84811 + 8.19635I$
$u = 0.93078 - 1.40973I$ $a = -0.113769 + 0.904087I$ $b = -1.44670 - 0.51890I$	$8.3544 + 14.2736I$	$1.90848 - 8.33140I$
$u = 0.93078 + 1.40973I$ $a = -0.113769 - 0.904087I$ $b = -1.44670 + 0.51890I$	$8.3544 - 14.2736I$	$1.90848 + 8.33140I$
$u = 0.986991 - 0.919090I$ $a = 0.549234 + 0.027574I$ $b = 0.197100 + 0.379729I$	$3.15987 + 3.90045I$	$-0.31532 - 1.57295I$
Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.986991 + 0.919090I$ $a = 0.549234 - 0.027574I$ $b = 0.197100 - 0.379729I$	$3.15987 - 3.90045I$	$-0.31532 + 1.57295I$

III. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1	$(u - 1)(u^{41} + 8u^{39} + \dots + 687u - 229)$
c_2	$(u - 1)(u^{41} + 2u^{40} + \dots - 97u + 29)$
c_3	$(u - 1)(u^{41} + 2u^{40} + \dots + 9u + 1)$
c_4	$(u - 1)(u^{41} + 2u^{40} + \dots - u + 1)$
c_5	$(u + 1)(u^{41} + 12u^{40} + \dots + 5u + 1)$
c_6	$(u - 1)(u^{41} + 4u^{40} + \dots + u + 1)$
c_7	$(u - 1)(u^{41} + 12u^{40} + \dots + 5u + 1)$
c_8	$(u + 1)(u^{41} + 2u^{40} + \dots - u + 1)$
c_9	$(u)(u^{41} + 7u^{40} + \dots + 6u + 2)$
c_{10}	$(u + 1)(u^{41} + 2u^{40} + \dots + 9u + 1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1	$(y - 1)(y^{41} + 16y^{40} + \dots + 1271637y - 52441)$
c_2	$(y - 1)(y^{41} + 48y^{40} + \dots - 7063y - 841)$
c_3, c_{10}	$(y - 1)(y^{41} - 32y^{40} + \dots + 141y - 1)$
c_4, c_8	$(y - 1)(y^{41} - 12y^{40} + \dots + 5y - 1)$
c_5, c_7	$(y - 1)(y^{41} + 36y^{40} + \dots + 5y - 1)$
c_6	$(y - 1)(y^{41} - 8y^{40} + \dots + 5y - 1)$
c_9	$(y)(y^{41} + 9y^{40} + \dots - 16y - 4)$