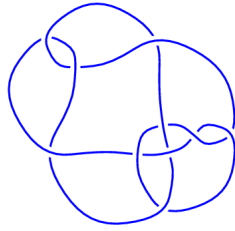
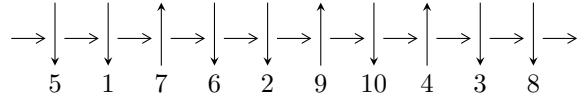


10<sub>84</sub> (K10a<sub>50</sub>)

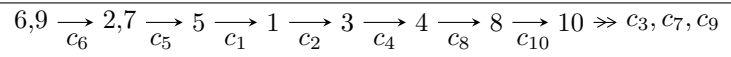


1

**Arc Sequences**



**Solving Sequence**



**Representation Ideals**

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

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

$$I_2^u = \langle u^{44} - 2u^{43} + \dots - 5u + 1, \\ - 41176720954033u^{43} + 41177574908895u^{42} + \dots + 146051535266254a - 227698823152567, \\ 341562975637964u^{43} - 406572656009514u^{42} + \dots + 73025767633127b - 406570229984954 \rangle$$

There are 2 irreducible components with 45 representations.

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

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

(i) Arc colorings

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

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

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

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

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

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

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

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

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

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

(ii) Obstruction class = 1

(iii) Cusp Shapes = -12

(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	-3.28987	-12.0000
$b =$	1.00000		

$$\text{II. } I_2^u = \langle u^{44} - 2u^{43} + \dots - 5u + 1, -4.12 \times 10^{13}u^{43} + 4.12 \times 10^{13}u^{42} + \dots + 1.46 \times 10^{14}a - 2.28 \times 10^{14}, 3.42 \times 10^{14}u^{43} - 4.07 \times 10^{14}u^{42} + \dots + 7.30 \times 10^{13}b - 4.07 \times 10^{14} \rangle$$

(i) Arc colorings

$$\begin{aligned} a_6 &= \begin{pmatrix} 0 \\ u \end{pmatrix} \\ a_9 &= \begin{pmatrix} 0.281933u^{43} - 0.281939u^{42} + \dots + 1.79325u + 1.55903 \\ -4.67729u^{43} + 5.56752u^{42} + \dots - 24.6290u + 5.56749 \end{pmatrix} \\ a_2 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_7 &= \begin{pmatrix} -0.827852u^{43} + 0.827859u^{42} + \dots + 0.349201u + 0.713929 \\ -1.03051u^{43} + 0.202663u^{42} + \dots - 1.52455u + 0.202656 \end{pmatrix} \\ a_5 &= \begin{pmatrix} u \\ u \end{pmatrix} \\ a_1 &= \begin{pmatrix} -u^2 + 1 \\ -u^2 \end{pmatrix} \\ a_3 &= \begin{pmatrix} u^4 - u^2 + 1 \\ u^4 \end{pmatrix} \\ a_4 &= \begin{pmatrix} u \\ -u^3 + u \end{pmatrix} \\ a_8 &= \begin{pmatrix} 3.42744u^{43} - 4.22738u^{42} + \dots + 16.7969u - 2.39369 \\ -3.13799u^{43} + 3.96035u^{42} + \dots - 18.2077u + 3.96035 \end{pmatrix} \\ a_{10} &= \begin{pmatrix} 3.32432u^{43} - 4.12437u^{42} + \dots + 17.6857u - 1.64218 \\ -3.23117u^{43} + 3.95888u^{42} + \dots - 18.3534u + 3.95888 \end{pmatrix} \end{aligned}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes

$$= -\frac{2627515223052688}{73025767633127}u^{43} + \frac{3096365063700750}{73025767633127}u^{42} + \dots - \frac{11221793809688154}{73025767633127}u + \frac{2703461955268724}{73025767633127}$$

(iv) Complex Volumes and Cusp Shapes

Solution to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.117850 - 0.238085I$		
$a = -0.609703 + 0.953355I$	$-5.29949 - 8.62766I$	$-9.10597 + 7.54655I$
$b = 0.100716 + 1.221306I$		
$u = -1.117850 + 0.238085I$		
$a = -0.609703 - 0.953355I$	$-5.29949 + 8.62766I$	$-9.10597 - 7.54655I$
$b = 0.100716 - 1.221306I$		
$u = -1.046833 - 0.731985I$		
$a = 0.343387 - 0.657464I$	$2.52892 - 6.89763I$	$-2.40126 + 7.96915I$
$b = -0.32765 - 1.51449I$		
$u = -1.046833 + 0.731985I$		
$a = 0.343387 + 0.657464I$	$2.52892 + 6.89763I$	$-2.40126 - 7.96915I$
$b = -0.32765 + 1.51449I$		
$u = -0.940979 - 0.796566I$		
$a = -0.354267 + 0.520071I$	$4.19341 - 3.30756I$	$0.011482 + 0.801201I$
$b = 0.60249 + 1.54002I$		
$u = -0.940979 + 0.796566I$		
$a = -0.354267 - 0.520071I$	$4.19341 + 3.30756I$	$0.011482 - 0.801201I$
$b = 0.60249 - 1.54002I$		
$u = -0.927602 - 0.226351I$		
$a = 0.560652 - 1.236271I$	$-1.13001 - 3.88298I$	$-6.50680 + 7.75927I$
$b = 0.043784 - 1.240856I$		
$u = -0.927602 + 0.226351I$		
$a = 0.560652 + 1.236271I$	$-1.13001 + 3.88298I$	$-6.50680 - 7.75927I$
$b = 0.043784 + 1.240856I$		
$u = -0.927070 - 0.063011I$		
$a = -1.24473 - 0.96687I$	$-4.92583 - 1.73663I$	$-14.9087 + 4.1335I$
$b = -0.082049 - 0.875982I$		
$u = -0.927070 + 0.063011I$		
$a = -1.24473 + 0.96687I$	$-4.92583 + 1.73663I$	$-14.9087 - 4.1335I$
$b = -0.082049 + 0.875982I$		

Solution to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.902384 - 0.723912I$ $a = 0.507257 + 0.137615I$ $b = -1.58594 + 0.66121I$	$1.21777 - 3.45181I$	$-0.07173 - 7.88863I$
$u = -0.902384 + 0.723912I$ $a = 0.507257 - 0.137615I$ $b = -1.58594 - 0.66121I$	$1.21777 + 3.45181I$	$-0.07173 + 7.88863I$
$u = -0.840203 - 0.731796I$ $a = -0.164817 - 0.539369I$ $b = 0.53132 - 2.01273I$	$1.40942 - 2.09852I$	$-2.80453 + 11.50069I$
$u = -0.840203 + 0.731796I$ $a = -0.164817 + 0.539369I$ $b = 0.53132 + 2.01273I$	$1.40942 + 2.09852I$	$-2.80453 - 11.50069I$
$u = -0.835443 - 0.852874I$ $a = -0.518292 + 0.463376I$ $b = 0.689770 + 1.106521I$	$4.53169 - 2.82413I$	$0.82204 + 4.92903I$
$u = -0.835443 + 0.852874I$ $a = -0.518292 - 0.463376I$ $b = 0.689770 - 1.106521I$	$4.53169 + 2.82413I$	$0.82204 - 4.92903I$
$u = -0.658922 - 0.846151I$ $a = 0.715869 - 0.523055I$ $b = -0.409660 - 0.763604I$	$3.70844 + 0.99499I$	$0.63089 - 2.41468I$
$u = -0.658922 + 0.846151I$ $a = 0.715869 + 0.523055I$ $b = -0.409660 + 0.763604I$	$3.70844 - 0.99499I$	$0.63089 + 2.41468I$
$u = -0.109387 - 0.546973I$ $a = 1.08917 - 1.26493I$ $b = 0.360722 - 0.412273I$	$1.40694 + 1.21023I$	$2.44144 - 1.67923I$
$u = -0.109387 + 0.546973I$ $a = 1.08917 + 1.26493I$ $b = 0.360722 + 0.412273I$	$1.40694 - 1.21023I$	$2.44144 + 1.67923I$

Solution to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.098222 - 0.805268I$ $a = -0.657267 + 1.165076I$ $b = -0.526324 + 0.735269I$	$-1.20700 + 5.24815I$	$-2.80453 - 6.18731I$
$u = 0.098222 + 0.805268I$ $a = -0.657267 - 1.165076I$ $b = -0.526324 - 0.735269I$	$-1.20700 - 5.24815I$	$-2.80453 + 6.18731I$
$u = 0.188748 - 0.259164I$ $a = 2.19298 + 0.17301I$ $b = -0.774894 + 0.798847I$	$-1.92044 + 0.80342I$	$-4.41092 + 0.12174I$
$u = 0.188748 + 0.259164I$ $a = 2.19298 - 0.17301I$ $b = -0.774894 - 0.798847I$	$-1.92044 - 0.80342I$	$-4.41092 - 0.12174I$
$u = 0.709073 - 0.883385I$ $a = 1.282350 + 0.350493I$ $b = -0.23249 + 1.74053I$	$2.27409 - 8.60569I$	$-2.63926 + 4.58190I$
$u = 0.709073 + 0.883385I$ $a = 1.282350 - 0.350493I$ $b = -0.23249 - 1.74053I$	$2.27409 + 8.60569I$	$-2.63926 - 4.58190I$
$u = 0.772905 - 0.818777I$ $a = -1.40320 - 0.38216I$ $b = 0.13503 - 2.03400I$	$5.49636 - 2.42871I$	$0.16687 + 2.25678I$
$u = 0.772905 + 0.818777I$ $a = -1.40320 + 0.38216I$ $b = 0.13503 + 2.03400I$	$5.49636 + 2.42871I$	$0.16687 - 2.25678I$
$u = 0.778786 - 0.710214I$ $a = -0.63814 + 1.33200I$ $b = -1.80012 + 0.59105I$	$0.040125 - 0.820231I$	$-5.81896 + 3.03229I$
$u = 0.778786 + 0.710214I$ $a = -0.63814 - 1.33200I$ $b = -1.80012 - 0.59105I$	$0.040125 + 0.820231I$	$-5.81896 - 3.03229I$

Solution to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.802912 - 0.142507I$ $a = -0.056058 + 0.503391I$ $b = -0.863523 + 0.653284I$	$-1.40557 + 0.34934I$	$-7.47293 - 0.48118I$
$u = 0.802912 + 0.142507I$ $a = -0.056058 - 0.503391I$ $b = -0.863523 - 0.653284I$	$-1.40557 - 0.34934I$	$-7.47293 + 0.48118I$
$u = 0.812067$ $a = -0.348070$ $b = 4.37701$	$-2.95636$	$47.1560$
$u = 0.878177 - 0.660456I$ $a = 1.03238 + 1.00638I$ $b = -1.21676 + 2.73043I$	$-1.82200 + 2.55706I$	$-9.50147 - 2.98004I$
$u = 0.878177 + 0.660456I$ $a = 1.03238 - 1.00638I$ $b = -1.21676 - 2.73043I$	$-1.82200 - 2.55706I$	$-9.50147 + 2.98004I$
$u = 0.940648 - 0.702120I$ $a = 1.28445 - 0.71103I$ $b = 1.54049 + 0.86048I$	$-0.45271 + 6.24747I$	$-7.31920 - 8.44159I$
$u = 0.940648 + 0.702120I$ $a = 1.28445 + 0.71103I$ $b = 1.54049 - 0.86048I$	$-0.45271 - 6.24747I$	$-7.31920 + 8.44159I$
$u = 0.973933 - 0.757495I$ $a = -0.398967 - 1.342726I$ $b = 1.59296 - 2.49221I$	$4.87682 + 8.33877I$	$-1.30313 - 7.62816I$
$u = 0.973933 + 0.757495I$ $a = -0.398967 + 1.342726I$ $b = 1.59296 + 2.49221I$	$4.87682 - 8.33877I$	$-1.30313 + 7.62816I$
$u = 1.033085 - 0.762400I$ $a = 0.321504 + 1.181857I$ $b = -1.42181 + 2.45773I$	$1.2704 + 14.7099I$	$-4.19051 - 9.02905I$



Solution to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.033085 + 0.762400I$ $a = 0.321504 - 1.181857I$ $b = -1.42181 - 2.45773I$	$1.2704 - 14.7099I$	$-4.19051 + 9.02905I$
$u = 1.133013 - 0.369128I$ $a = 0.602338 - 0.335878I$ $b = 0.661706 + 0.111988I$	$-4.55359 - 1.09231I$	$-9.24999 + 5.05772I$
$u = 1.133013 + 0.369128I$ $a = 0.602338 + 0.335878I$ $b = 0.661706 - 0.111988I$	$-4.55359 + 1.09231I$	$-9.24999 - 5.05772I$
$u = 1.18227$ $a = -0.425732$ $b = -0.412521$	$-2.71479$	$5.71832$

### III. u-Polynomials

Crossings	u-Polynomials at each crossings
$c_1$	$(u - 1)(u^{44} + 2u^{43} + \dots + 5u + 1)$
$c_2$	$(u + 1)(u^{44} + 14u^{43} + \dots - u + 1)$
$c_3$	$(u - 1)(u^{44} + 4u^{43} + \dots - u - 1)$
$c_4$	$(u - 1)(u^{44} + 14u^{43} + \dots - u + 1)$
$c_5$	$(u + 1)(u^{44} + 2u^{43} + \dots + 5u + 1)$
$c_6$	$(u)(u^{44} + 7u^{43} + \dots - 2u + 2)$
$c_7$	$(u - 1)(u^{44} + 2u^{43} + \dots + 5u - 1)$
$c_8$	$(u + 1)(u^{44} + 2u^{43} + \dots + 17u - 11)$
$c_9$	$(u + 1)(u^{44} + 4u^{43} + \dots + 21u + 1)$
$c_{10}$	$(u + 1)(u^{44} + 2u^{43} + \dots + 5u - 1)$

#### IV. Riley Polynomials

Crossings	Riley Polynomials at each crossings
$c_1, c_5$	$(y - 1)(y^{44} - 14y^{43} + \dots + y + 1)$
$c_2, c_4$	$(y - 1)(y^{44} + 34y^{43} + \dots + 137y + 1)$
$c_3$	$(y - 1)(y^{44} + 6y^{43} + \dots + y + 1)$
$c_6$	$(y)(y^{44} - 9y^{43} + \dots - 40y + 4)$
$c_7$	$(y - 1)(y^{44} - 26y^{43} + \dots - 71y + 1)$
$c_8$	$(y - 1)(y^{44} - 42y^{43} + \dots - 2995y + 121)$
$c_9$	$(y - 1)(y^{44} - 38y^{43} + \dots - 123y + 1)$
$c_{10}$	$(y - 1)(y^{44} - 26y^{43} + \dots - 71y + 1)$