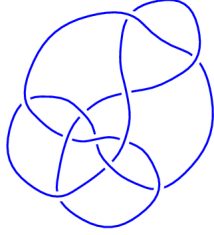
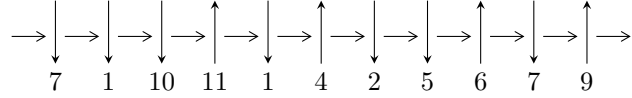


11n₁₄₈ (K11n₁₄₈)

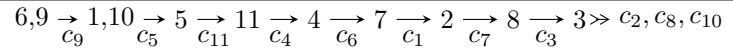


1

Arc Sequences



Solving Sequence



Representation Ideals

$$I = \bigcap_{i=1}^8 I_i^u$$

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

$$I_2^u = \langle u^4 - u^3 - 2u^2 - 2u - 1, b - 1, -u^3 + 2u^2 + a + 1 \rangle$$

$$I_3^u = \langle u^{16} - u^{15} + \dots + 14u + 61, -22357005u^{15} + 12474938u^{14} + \dots + 943269704b - 1552686477, \\ -57642887284u^{15} + 85423866513u^{14} + \dots + 2100189995956a - 2228390399233 \rangle$$

$$I_4^u = \langle u^{12} - u^{10} + 4u^8 - 8u^7 + 14u^6 + 15u^5 - 33u^4 + u^3 + 26u^2 + 3u + 1, \\ 107599u^{11} - 104920u^{10} + \dots + 501166b - 689759, \\ 107599u^{11} - 104920u^{10} + \dots + 501166a - 1190925 \rangle$$

$$I_5^u = \langle u^{13} - u^{12} - 6u^{11} + 8u^{10} + 21u^9 - 27u^8 - 41u^7 + 43u^6 + 41u^5 - 35u^4 - 12u^3 + 10u^2 + u - 1, \\ -321u^{12} + 2u^{11} + \dots + 1546a - 5482, -321u^{12} + 2u^{11} + \dots + 1546b - 3936 \rangle$$

$$I_6^u = \langle u^{16} + u^{15} + 5u^{14} + 7u^{13} + 8u^{12} + 15u^{11} + 8u^{10} + 6u^9 + 11u^8 - 10u^7 - 11u^5 - 4u^4 + 5u^3 + u^2 - u + 1, \\ -93021u^{15} - 270243u^{14} + \dots + 478966a + 198193, \\ -93021u^{15} - 270243u^{14} + \dots + 478966b - 280773 \rangle$$

$$I_7^u = \langle u^2 - u + 1, a + u, b + u - 1 \rangle$$

$$I_8^u = \langle u^8 + u^7 - 2u^6 - 3u^5 + 10u^4 - 7u^3 - 3u^2 + 4, -3u^7 - 5u^6 + 5u^4 - 24u^3 + 17u^2 + 16b - u - 2, \\ -15u^7 - 29u^6 - 4u^5 + 37u^4 - 100u^3 + 33u^2 + 32a + 7u + 78 \rangle$$

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

There are 8 irreducible components with 73 representations.

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

(i) Arc colorings

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

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

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

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

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

$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

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

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

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

$$a_3 = \begin{pmatrix} u \\ -u + 1 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} u \\ -u + 1 \end{pmatrix}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes = unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.61803$ $a = 1.00000$ $b = 0$	-8.88264	-10.0000
$u = 0.618034$ $a = 1.00000$ $b = 0$	-0.986960	-10.0000

$$\text{II. } I_2^u = \langle u^4 - u^3 - 2u^2 - 2u - 1, b - 1, -u^3 + 2u^2 + a + 1 \rangle$$

(i) Arc colorings

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

$$a_9 = \begin{pmatrix} u^3 - 2u^2 - 1 \\ 1 \end{pmatrix}$$

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

$$a_{10} = \begin{pmatrix} u^3 - 2u^2 - 1 \\ -u^3 + u^2 + u + 2 \end{pmatrix}$$

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

$$a_{11} = \begin{pmatrix} u^3 - 2u^2 \\ 1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u^3 + u^2 + 2u + 2 \\ u^3 - 2u^2 - 1 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u^3 - u^2 - 2u - 2 \\ -u^3 + 2u^2 + u + 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} u^3 - 2u^2 \\ -u^3 + 2u^2 + u + 2 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -u \\ u^3 - 2u^2 - u - 2 \end{pmatrix}$$

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

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

(ii) Obstruction class = -1

(iii) Cusp Shapes = unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.698478$ $a = -2.31651$ $b = 1.00000$	-5.59278	2.00000
$u = -0.309017 - 0.722871I$ $a = 0.309017 - 0.722871I$ $b = 1.00000$	2.30291	2.00000
$u = -0.309017 + 0.722871I$ $a = 0.309017 + 0.722871I$ $b = 1.00000$	2.30291	2.00000
$u = 2.31651$ $a = 0.698478$ $b = 1.00000$	-5.59278	2.00000

$$\text{III. } I_3^u = \langle u^{16} - u^{15} + \dots + 14u + 61, -2.24 \times 10^7 u^{15} + 1.25 \times 10^7 u^{14} + \dots + 9.43 \times 10^8 b - 1.55 \times 10^9, -5.76 \times 10^{10} u^{15} + 8.54 \times 10^{10} u^{14} + \dots + 2.10 \times 10^{12} a - 2.23 \times 10^{12} \rangle$$

(i) Arc colorings

$$\begin{aligned} a_6 &= \begin{pmatrix} 0 \\ u \end{pmatrix} \\ a_9 &= \begin{pmatrix} 0.0274465u^{15} - 0.0406744u^{14} + \dots + 0.716525u + 1.06104 \\ 0.0237016u^{15} - 0.0132252u^{14} + \dots - 0.113158u + 1.64607 \end{pmatrix} \\ a_1 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_{10} &= \begin{pmatrix} 0.0274465u^{15} - 0.0406744u^{14} + \dots + 0.716525u + 1.06104 \\ 0.0340469u^{15} - 0.0806004u^{14} + \dots + 1.37589u + 0.839170 \end{pmatrix} \\ a_5 &= \begin{pmatrix} u \\ u \end{pmatrix} \\ a_{11} &= \begin{pmatrix} 0.0303555u^{15} - 0.0924801u^{14} + \dots + 1.90761u - 0.236166 \\ 0.0459775u^{15} - 0.0943423u^{14} + \dots + 1.70908u + 0.936523 \end{pmatrix} \\ a_4 &= \begin{pmatrix} -0.00434068u^{15} - 0.000897861u^{14} + \dots + 1.00660u - 0.539233 \\ -0.0350956u^{15} + 0.0565652u^{14} + \dots - 0.620527u - 0.728102 \end{pmatrix} \\ a_7 &= \begin{pmatrix} -0.0361859u^{15} + 0.0770289u^{14} + \dots - 2.74053u - 1.11976 \\ -0.0106763u^{15} + 0.0122559u^{14} + \dots - 0.216578u - 0.799890 \end{pmatrix} \\ a_2 &= \begin{pmatrix} 0.00374491u^{15} - 0.0274491u^{14} + \dots + 0.829683u + 1.41497 \\ -0.0106763u^{15} + 0.0122559u^{14} + \dots - 0.216578u + 0.200110 \end{pmatrix} \\ a_8 &= \begin{pmatrix} 0.00693140u^{15} + 0.0151933u^{14} + \dots - 0.613105u + 0.384916 \\ 0.0106763u^{15} - 0.0122559u^{14} + \dots + 0.216578u - 0.200110 \end{pmatrix} \\ a_3 &= \begin{pmatrix} 0.0144212u^{15} - 0.0397050u^{14} + \dots + 1.04626u + 1.21486 \\ -0.0106763u^{15} + 0.0122559u^{14} + \dots - 0.216578u + 0.200110 \end{pmatrix} \\ a_3 &= \begin{pmatrix} 0.0144212u^{15} - 0.0397050u^{14} + \dots + 1.04626u + 1.21486 \\ -0.0106763u^{15} + 0.0122559u^{14} + \dots - 0.216578u + 0.200110 \end{pmatrix} \end{aligned}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes = unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.009747 - 0.554510I$ $a = -0.153018 - 0.528546I$ $b = 1.12196 - 1.05376I$	$-5.59278 - 4.05977I$	$2.00000 + 6.92820I$
$u = -1.009747 + 0.554510I$ $a = -0.153018 + 0.528546I$ $b = 1.12196 + 1.05376I$	$-5.59278 + 4.05977I$	$2.00000 - 6.92820I$
$u = -0.756001 - 0.910051I$ $a = -0.622297 + 0.541933I$ $b = -0.621964 - 0.187730I$	$2.30291 + 4.05977I$	$2.00000 - 6.92820I$
$u = -0.756001 + 0.910051I$ $a = -0.622297 - 0.541933I$ $b = -0.621964 + 0.187730I$	$2.30291 - 4.05977I$	$2.00000 + 6.92820I$
$u = -0.627115 - 0.928941I$ $a = 0.123717 - 1.286494I$ $b = 1.12196 - 1.05376I$	$2.30291 - 4.05977I$	$2.00000 + 6.92820I$
$u = -0.627115 + 0.928941I$ $a = 0.123717 + 1.286494I$ $b = 1.12196 + 1.05376I$	$2.30291 + 4.05977I$	$2.00000 - 6.92820I$
$u = -0.303235 - 1.148636I$ $a = 1.44027 + 1.20520I$ $b = -0.621964 + 0.187730I$	$-5.59278 - 4.05977I$	$2.00000 + 6.92820I$
$u = -0.303235 + 1.148636I$ $a = 1.44027 - 1.20520I$ $b = -0.621964 - 0.187730I$	$-5.59278 + 4.05977I$	$2.00000 - 6.92820I$
$u = 0.409816 - 1.073266I$ $a = 0.171854 + 0.832241I$ $b = 1.12196 + 1.05376I$	$2.30291 + 4.05977I$	$2.00000 - 6.92820I$
$u = 0.409816 + 1.073266I$ $a = 0.171854 - 0.832241I$ $b = 1.12196 - 1.05376I$	$2.30291 - 4.05977I$	$2.00000 + 6.92820I$

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.54336 - 2.67729I$		
$a = -0.231984 - 0.004678I$	$-5.59278 - 4.05977I$	$2.00000 + 6.92820I$
$b = -0.621964 + 0.187730I$		
$u = 0.54336 + 2.67729I$		
$a = -0.231984 + 0.004678I$	$-5.59278 + 4.05977I$	$2.00000 - 6.92820I$
$b = -0.621964 - 0.187730I$		
$u = 0.664283 - 0.551323I$		
$a = -0.62259 - 1.55822I$	$2.30291 + 4.05977I$	$2.00000 - 6.92820I$
$b = -0.621964 - 0.187730I$		
$u = 0.664283 + 0.551323I$		
$a = -0.62259 + 1.55822I$	$2.30291 - 4.05977I$	$2.00000 + 6.92820I$
$b = -0.621964 + 0.187730I$		
$u = 1.57864 - 0.17666I$		
$a = 0.451424 + 1.329975I$	$-5.59278 + 4.05977I$	$2.00000 - 6.92820I$
$b = 1.12196 + 1.05376I$		
$u = 1.57864 + 0.17666I$		
$a = 0.451424 - 1.329975I$	$-5.59278 - 4.05977I$	$2.00000 + 6.92820I$
$b = 1.12196 - 1.05376I$		

IV.

$$I_4^u = \langle u^{12} - u^{10} + \dots + 3u + 1, 1.08 \times 10^5 u^{11} - 1.05 \times 10^5 u^{10} + \dots + 5.01 \times 10^5 b - 6.90 \times 10^5, 1.08 \times 10^5 u^{11} - 1.05 \times 10^5 u^{10} + \dots + 5.01 \times 10^5 a - 1.19 \times 10^6 \rangle$$

(i) Arc colorings

$$\begin{aligned} a_6 &= \begin{pmatrix} 0 \\ u \end{pmatrix} \\ a_9 &= \begin{pmatrix} -0.214697u^{11} + 0.209352u^{10} + \dots - 3.64429u + 2.37631 \\ -0.214697u^{11} + 0.209352u^{10} + \dots - 3.64429u + 1.37631 \end{pmatrix} \\ a_1 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_{10} &= \begin{pmatrix} -0.214697u^{11} + 0.209352u^{10} + \dots - 3.64429u + 2.37631 \\ -0.0662695u^{11} + 0.205638u^{10} + \dots - 3.23093u + 1.58566 \end{pmatrix} \\ a_5 &= \begin{pmatrix} u \\ u \end{pmatrix} \\ a_{11} &= \begin{pmatrix} -0.559858u^{11} + 0.249592u^{10} + \dots - 14.6019u + 4.72343 \\ -0.345161u^{11} + 0.0402402u^{10} + \dots - 10.9577u + 2.34713 \end{pmatrix} \\ a_4 &= \begin{pmatrix} -0.541056u^{11} - 0.0710822u^{10} + \dots - 16.5766u - 2.22544 \\ -0.0821125u^{11} - 0.142164u^{10} + \dots - 8.15318u - 1.45089 \end{pmatrix} \\ a_7 &= \begin{pmatrix} -0.222463u^{11} - 0.120579u^{10} + \dots - 10.4193u - 1.59450 \\ 0.0271287u^{11} - 0.0432332u^{10} + \dots - 4.01627u - 1.03465 \end{pmatrix} \\ a_2 &= \begin{pmatrix} 0.502897u^{11} - 0.0968501u^{10} + \dots + 14.0420u + 1.26814 \\ 0.253305u^{11} - 0.174196u^{10} + \dots + 7.63894u + 0.708286 \end{pmatrix} \\ a_8 &= \begin{pmatrix} 0.214697u^{11} - 0.209352u^{10} + \dots + 3.64429u - 2.37631 \\ 0.214697u^{11} - 0.209352u^{10} + \dots + 3.64429u - 1.37631 \end{pmatrix} \\ a_3 &= \begin{pmatrix} 0.249592u^{11} + 0.0773456u^{10} + \dots + 6.40301u + 0.559858 \\ 0.253305u^{11} - 0.174196u^{10} + \dots + 7.63894u + 0.708286 \end{pmatrix} \\ a_3 &= \begin{pmatrix} 0.249592u^{11} + 0.0773456u^{10} + \dots + 6.40301u + 0.559858 \\ 0.253305u^{11} - 0.174196u^{10} + \dots + 7.63894u + 0.708286 \end{pmatrix} \end{aligned}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes = unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_4^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.47610 - 1.13544I$		
$a = 0.072137 + 0.822717I$	$-9.45817 - 7.70670I$	$-6.10501 + 5.38862I$
$b = -0.927863 + 0.822717I$		
$u = -1.47610 + 1.13544I$		
$a = 0.072137 - 0.822717I$	$-9.45817 + 7.70670I$	$-6.10501 - 5.38862I$
$b = -0.927863 - 0.822717I$		
$u = -0.968045 - 0.076481I$		
$a = 0.383021 + 1.137411I$	$-2.70944 + 2.74874I$	$-6.55410 - 3.66193I$
$b = -0.616979 + 1.137411I$		
$u = -0.968045 + 0.076481I$		
$a = 0.383021 - 1.137411I$	$-2.70944 - 2.74874I$	$-6.55410 + 3.66193I$
$b = -0.616979 - 1.137411I$		
$u = -0.052940 - 0.185549I$		
$a = 2.83415 + 0.57218I$	$3.94294 + 2.97593I$	$-11.8409 - 20.9878I$
$b = 1.83415 + 0.57218I$		
$u = -0.052940 + 0.185549I$		
$a = 2.83415 - 0.57218I$	$3.94294 - 2.97593I$	$-11.8409 + 20.9878I$
$b = 1.83415 - 0.57218I$		
$u = 0.19389 - 1.60136I$		
$a = 0.339022 - 0.068445I$	$3.94294 + 2.97593I$	$-11.8409 - 20.9878I$
$b = -0.660978 - 0.068445I$		
$u = 0.19389 + 1.60136I$		
$a = 0.339022 + 0.068445I$	$3.94294 - 2.97593I$	$-11.8409 + 20.9878I$
$b = -0.660978 + 0.068445I$		
$u = 1.126213 - 0.587419I$		
$a = 0.105762 + 1.206211I$	$-9.45817 + 7.70670I$	$-6.10501 - 5.38862I$
$b = -0.89424 + 1.20621I$		
$u = 1.126213 + 0.587419I$		
$a = 0.105762 - 1.206211I$	$-9.45817 - 7.70670I$	$-6.10501 + 5.38862I$
$b = -0.89424 - 1.20621I$		

Solution to I_4^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.176984 - 0.755737I$	$-2.70944 + 2.74874I$	$-6.55410 - 3.66193I$
$a = 0.265911 - 0.789645I$		
$b = -0.734089 - 0.789645I$		
$u = 1.176984 + 0.755737I$	$-2.70944 - 2.74874I$	$-6.55410 + 3.66193I$
$a = 0.265911 + 0.789645I$		
$b = -0.734089 + 0.789645I$		

$$\mathbf{V. } I_5^u = \langle u^{13} - u^{12} + \dots + u - 1, -321u^{12} + 2u^{11} + \dots + 1546a - 5482, -321u^{12} + 2u^{11} + \dots + 1546b - 3936 \rangle$$

(i) Arc colorings

$$\begin{aligned} a_6 &= \begin{pmatrix} 0 \\ u \end{pmatrix} \\ a_9 &= \begin{pmatrix} 0.207633u^{12} - 0.00129366u^{11} + \dots - 0.286546u + 3.54592 \\ 0.207633u^{12} - 0.00129366u^{11} + \dots - 0.286546u + 2.54592 \end{pmatrix} \\ a_1 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_{10} &= \begin{pmatrix} 0.207633u^{12} - 0.00129366u^{11} + \dots - 0.286546u + 3.54592 \\ 0.197283u^{12} - 0.0588616u^{11} + \dots - 0.287840u + 2.33959 \end{pmatrix} \\ a_5 &= \begin{pmatrix} u \\ u \end{pmatrix} \\ a_{11} &= \begin{pmatrix} 0.792367u^{12} + 0.00129366u^{11} + \dots - 1.71345u + 7.45408 \\ 0.584735u^{12} + 0.00258732u^{11} + \dots - 1.42691u + 3.90815 \end{pmatrix} \\ a_4 &= \begin{pmatrix} -2.54592u^{12} + 2.33829u^{11} + \dots - 14.3182u - 2.25938 \\ -1.54592u^{12} + 1.33829u^{11} + \dots - 5.31824u - 1.25938 \end{pmatrix} \\ a_7 &= \begin{pmatrix} 3.90815u^{12} - 3.32342u^{11} + \dots + 14.3635u + 2.48124 \\ 1.56856u^{12} - 1.18111u^{11} + \dots + 3.38357u + 0.429495 \end{pmatrix} \\ a_2 &= \begin{pmatrix} -3.74709u^{12} + 3.31307u^{11} + \dots - 14.1559u - 3.11384 \\ -1.40750u^{12} + 1.17076u^{11} + \dots - 3.17594u - 1.06210 \end{pmatrix} \\ a_8 &= \begin{pmatrix} -0.207633u^{12} + 0.00129366u^{11} + \dots + 0.286546u - 3.54592 \\ -0.207633u^{12} + 0.00129366u^{11} + \dots + 0.286546u - 2.54592 \end{pmatrix} \\ a_3 &= \begin{pmatrix} -2.33959u^{12} + 2.14230u^{11} + \dots - 10.9799u - 2.05175 \\ -1.40750u^{12} + 1.17076u^{11} + \dots - 3.17594u - 1.06210 \end{pmatrix} \\ a_3 &= \begin{pmatrix} -2.33959u^{12} + 2.14230u^{11} + \dots - 10.9799u - 2.05175 \\ -1.40750u^{12} + 1.17076u^{11} + \dots - 3.17594u - 1.06210 \end{pmatrix} \end{aligned}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes = unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_5^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.40672 - 0.68037I$ $a = -0.181895 + 0.882512I$ $b = -1.18190 + 0.88251I$	$-1.01550 - 9.99038I$	$-3.69502 + 7.61192I$
$u = -1.40672 + 0.68037I$ $a = -0.181895 - 0.882512I$ $b = -1.18190 - 0.88251I$	$-1.01550 + 9.99038I$	$-3.69502 - 7.61192I$
$u = -1.310047 - 0.430816I$ $a = 0.198762 - 0.785064I$ $b = -0.801238 - 0.785064I$	$-9.72048 - 1.68662I$	$-6.99569 - 0.12715I$
$u = -1.310047 + 0.430816I$ $a = 0.198762 + 0.785064I$ $b = -0.801238 + 0.785064I$	$-9.72048 + 1.68662I$	$-6.99569 + 0.12715I$
$u = -0.458477 - 0.058416I$ $a = 1.90441 - 0.30820I$ $b = 0.904408 - 0.308199I$	$2.02562 - 0.48569I$	$2.64958 - 0.42406I$
$u = -0.458477 + 0.058416I$ $a = 1.90441 + 0.30820I$ $b = 0.904408 + 0.308199I$	$2.02562 + 0.48569I$	$2.64958 + 0.42406I$
$u = 0.440196 - 0.153722I$ $a = 1.79825 + 0.79616I$ $b = 0.798249 + 0.796164I$	$0.31710 + 4.56636I$	$-5.37309 - 4.90464I$
$u = 0.440196 + 0.153722I$ $a = 1.79825 - 0.79616I$ $b = 0.798249 - 0.796164I$	$0.31710 - 4.56636I$	$-5.37309 + 4.90464I$
$u = 0.679240$ $a = 1.08050$ $b = 0.0804976$	-0.985814	-9.93790
$u = 1.319414 - 0.222030I$ $a = -0.130694 - 0.699453I$ $b = -1.130694 - 0.699453I$	$-1.44982 + 2.92540I$	$-5.79046 - 3.21859I$

Solution to I_5^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.319414 + 0.222030I$		
$a = -0.130694 + 0.699453I$	$-1.44982 - 2.92540I$	$-5.79046 + 3.21859I$
$b = -1.130694 + 0.699453I$		
$u = 1.57602 - 1.15308I$		
$a = -0.129078 - 0.968137I$	$-8.5808 + 15.4617I$	$-4.82638 - 7.62465I$
$b = -1.12908 - 0.96814I$		
$u = 1.57602 + 1.15308I$		
$a = -0.129078 + 0.968137I$	$-8.5808 - 15.4617I$	$-4.82638 + 7.62465I$
$b = -1.12908 + 0.96814I$		

VI.

$$I_6^u = \langle u^{16} + u^{15} + \dots - u + 1, -9.30 \times 10^4 u^{15} - 2.70 \times 10^5 u^{14} + \dots + 4.79 \times 10^5 a + 1.98 \times 10^5, -9.30 \times 10^4 u^{15} - 2.70 \times 10^5 u^{14} + \dots + 4.79 \times 10^5 b - 2.81 \times 10^5 \rangle$$

(i) Arc colorings

$$\begin{aligned} a_6 &= \begin{pmatrix} 0 \\ u \end{pmatrix} \\ a_9 &= \begin{pmatrix} 0.194212u^{15} + 0.564222u^{14} + \dots + 1.82389u - 0.413793 \\ 0.194212u^{15} + 0.564222u^{14} + \dots + 1.82389u + 0.586207 \end{pmatrix} \\ a_1 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_{10} &= \begin{pmatrix} 0.194212u^{15} + 0.564222u^{14} + \dots + 1.82389u - 0.413793 \\ 0.0691615u^{15} + 0.398237u^{14} + \dots + 1.64809u + 0.956216 \end{pmatrix} \\ a_5 &= \begin{pmatrix} u \\ u \end{pmatrix} \\ a_{11} &= \begin{pmatrix} 0.307696u^{15} + 0.294952u^{14} + \dots + 1.72472u + 2.01426 \\ 0.501908u^{15} + 0.859174u^{14} + \dots + 3.54861u + 1.60046 \end{pmatrix} \\ a_4 &= \begin{pmatrix} 1.05980u^{15} + 1.34912u^{14} + \dots - 0.102487u - 0.868819 \\ 0.677044u^{15} + 0.810955u^{14} + \dots + 1.43905u - 0.982304 \end{pmatrix} \\ a_7 &= \begin{pmatrix} -0.748905u^{15} - 1.28623u^{14} + \dots + 0.209516u + 0.852783 \\ -0.236998u^{15} - 0.142501u^{14} + \dots - 0.153460u + 0.459400 \end{pmatrix} \\ a_2 &= \begin{pmatrix} 0.121863u^{15} + 0.703776u^{14} + \dots - 2.13627u + 0.274510 \\ -0.390044u^{15} - 0.439952u^{14} + \dots - 1.77330u + 0.667893 \end{pmatrix} \\ a_8 &= \begin{pmatrix} 0.194212u^{15} + 0.564222u^{14} + \dots + 1.82389u - 0.413793 \\ 0.194212u^{15} + 0.564222u^{14} + \dots + 1.82389u + 0.586207 \end{pmatrix} \\ a_3 &= \begin{pmatrix} 0.511907u^{15} + 1.14373u^{14} + \dots - 0.362976u - 0.393383 \\ -0.390044u^{15} - 0.439952u^{14} + \dots - 1.77330u + 0.667893 \end{pmatrix} \\ a_3 &= \begin{pmatrix} 0.511907u^{15} + 1.14373u^{14} + \dots - 0.362976u - 0.393383 \\ -0.390044u^{15} - 0.439952u^{14} + \dots - 1.77330u + 0.667893 \end{pmatrix} \end{aligned}$$

(ii) Obstruction class = 1

(iii) Cusp Shapes = unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_6^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.305319 - 0.359264I$		
$a = -0.035028 - 1.046960I$	$-6.45579 - 3.75611I$	$-8.46169 + 3.08159I$
$b = 0.96497 - 1.04696I$		
$u = -1.305319 + 0.359264I$		
$a = -0.035028 + 1.046960I$	$-6.45579 + 3.75611I$	$-8.46169 - 3.08159I$
$b = 0.96497 + 1.04696I$		
$u = -0.610814 - 0.255978I$		
$a = -1.81011 + 0.05140I$	$2.34546 + 2.94891I$	$0.795967 + 0.602909I$
$b = -0.810108 + 0.051396I$		
$u = -0.610814 + 0.255978I$		
$a = -1.81011 - 0.05140I$	$2.34546 - 2.94891I$	$0.795967 - 0.602909I$
$b = -0.810108 - 0.051396I$		
$u = -0.274263 - 1.008872I$		
$a = 0.128987 - 1.171607I$	$1.71914 - 5.38582I$	$-0.93122 + 9.75922I$
$b = 1.12899 - 1.17161I$		
$u = -0.274263 + 1.008872I$		
$a = 0.128987 + 1.171607I$	$1.71914 + 5.38582I$	$-0.93122 - 9.75922I$
$b = 1.12899 + 1.17161I$		
$u = -0.10979 - 1.65368I$		
$a = -0.817152 - 0.254055I$	$-6.45579 - 3.75611I$	$-8.46169 + 3.08159I$
$b = 0.182848 - 0.254055I$		
$u = -0.10979 + 1.65368I$		
$a = -0.817152 + 0.254055I$	$-6.45579 + 3.75611I$	$-8.46169 - 3.08159I$
$b = 0.182848 + 0.254055I$		
$u = 0.213253 - 0.417979I$		
$a = 0.826847 - 0.591733I$	$4.03613 - 2.81197I$	$9.0969 - 15.4678I$
$b = 1.82685 - 0.59173I$		
$u = 0.213253 + 0.417979I$		
$a = 0.826847 + 0.591733I$	$4.03613 + 2.81197I$	$9.0969 + 15.4678I$
$b = 1.82685 + 0.59173I$		

Solution to I_6^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.24620 - 1.56767I$	$4.03613 + 2.81197I$	$9.0969 + 15.4678I$
$a = -0.300650 + 0.001924I$		
$b = 0.699350 + 0.001924I$		
$u = 0.24620 + 1.56767I$	$4.03613 - 2.81197I$	$9.0969 - 15.4678I$
$a = -0.300650 - 0.001924I$		
$b = 0.699350 - 0.001924I$		
$u = 0.638849 - 1.040845I$	$2.34546 + 2.94891I$	$0.795967 + 0.602909I$
$a = 0.177770 + 0.965779I$		
$b = 1.17777 + 0.96578I$		
$u = 0.638849 + 1.040845I$	$2.34546 - 2.94891I$	$0.795967 - 0.602909I$
$a = 0.177770 - 0.965779I$		
$b = 1.17777 - 0.96578I$		
$u = 0.701878 - 0.091386I$	$1.71914 + 5.38582I$	$-0.93122 - 9.75922I$
$a = -1.67067 - 0.48993I$		
$b = -0.670666 - 0.489931I$		
$u = 0.701878 + 0.091386I$	$1.71914 - 5.38582I$	$-0.93122 + 9.75922I$
$a = -1.67067 + 0.48993I$		
$b = -0.670666 + 0.489931I$		

$$\text{VII. } \Gamma_7^u = \langle u^2 - u + 1, a + u, b + u - 1 \rangle$$

(i) Arc colorings

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

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

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

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

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

$$a_{11} = \begin{pmatrix} 0 \\ -u \end{pmatrix}$$

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

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

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

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

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

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

(ii) Obstruction class = 1

(iii) Cusp Shapes = unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_7^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.500000 - 0.866025I$	$4.05977I$	$-6.92820I$
$a = -0.500000 + 0.866025I$		
$b = 0.500000 + 0.866025I$		
$u = 0.500000 + 0.866025I$	$-4.05977I$	$6.92820I$
$a = -0.500000 - 0.866025I$		
$b = 0.500000 - 0.866025I$		

$$\text{VIII. } I_8^u = \langle u^8 + u^7 - 2u^6 - 3u^5 + 10u^4 - 7u^3 - 3u^2 + 4, -3u^7 - 5u^6 + \dots + 16b - 2, -15u^7 - 29u^6 + \dots + 32a + 78 \rangle$$

(i) Arc colorings

$$\begin{aligned} a_6 &= \begin{pmatrix} 0 \\ u \end{pmatrix} \\ a_9 &= \begin{pmatrix} 0.468750u^7 + 0.906250u^6 + \dots - 0.218750u - 2.43750 \\ \frac{3}{16}u^7 + \frac{5}{16}u^6 + \dots + \frac{1}{16}u + \frac{1}{8} \end{pmatrix} \\ a_1 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_{10} &= \begin{pmatrix} 0.468750u^7 + 0.906250u^6 + \dots - 0.218750u - 2.43750 \\ -0.437500u^7 - 0.812500u^6 + \dots + 1.93750u + 1.87500 \end{pmatrix} \\ a_5 &= \begin{pmatrix} u \\ u \end{pmatrix} \\ a_{11} &= \begin{pmatrix} 0.0937500u^7 + 0.281250u^6 + \dots - 0.843750u - 1.18750 \\ \frac{3}{16}u^7 + \frac{5}{16}u^6 + \dots + \frac{1}{16}u - \frac{7}{8} \end{pmatrix} \\ a_4 &= \begin{pmatrix} 0.0312500u^7 - 0.156250u^6 + \dots + 0.968750u - 0.0625000 \\ \frac{3}{16}u^7 + \frac{5}{16}u^6 + \dots - \frac{11}{16}u - \frac{3}{8} \end{pmatrix} \\ a_7 &= \begin{pmatrix} 0.218750u^7 + 0.406250u^6 + \dots - 1.71875u + 0.0625000 \\ -\frac{3}{16}u^7 - \frac{5}{16}u^6 + \dots + \frac{19}{16}u + \frac{3}{8} \end{pmatrix} \\ a_2 &= \begin{pmatrix} 0.281250u^7 + 0.593750u^6 + \dots - 0.281250u - 0.562500 \\ -0.187500u^7 - 0.312500u^6 + \dots + 1.18750u + 1.37500 \end{pmatrix} \\ a_8 &= \begin{pmatrix} -0.0937500u^7 - 0.281250u^6 + \dots - 0.906250u + 1.18750 \\ \frac{3}{16}u^7 + \frac{5}{16}u^6 + \dots - \frac{19}{16}u - \frac{11}{8} \end{pmatrix} \\ a_3 &= \begin{pmatrix} 0.468750u^7 + 0.906250u^6 + \dots - 1.46875u - 1.93750 \\ -0.187500u^7 - 0.312500u^6 + \dots + 1.18750u + 1.37500 \end{pmatrix} \\ a_3 &= \begin{pmatrix} 0.468750u^7 + 0.906250u^6 + \dots - 1.46875u - 1.93750 \\ -0.187500u^7 - 0.312500u^6 + \dots + 1.18750u + 1.37500 \end{pmatrix} \end{aligned}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes = unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_g^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.83354 - 1.20197I$		
$a = 0.159020 - 0.533804I$	$-8.88264 - 4.05977I$	$-10.00000 + 6.92820I$
$b = 0.500000 - 0.866025I$		
$u = -1.83354 + 1.20197I$		
$a = 0.159020 + 0.533804I$	$-8.88264 + 4.05977I$	$-10.00000 - 6.92820I$
$b = 0.500000 + 0.866025I$		
$u = -0.476886 - 0.483675I$		
$a = -1.38053 - 1.09531I$	$-0.98696 - 4.05977I$	$-10.00000 + 6.92820I$
$b = 0.500000 - 0.866025I$		
$u = -0.476886 + 0.483675I$		
$a = -1.38053 + 1.09531I$	$-0.98696 + 4.05977I$	$-10.00000 - 6.92820I$
$b = 0.500000 + 0.866025I$		
$u = 0.785903 - 1.018908I$		
$a = -0.023975 + 0.802141I$	$-0.98696 + 4.05977I$	$-10.00000 - 6.92820I$
$b = 0.500000 + 0.866025I$		
$u = 0.785903 + 1.018908I$		
$a = -0.023975 - 0.802141I$	$-0.98696 - 4.05977I$	$-10.00000 + 6.92820I$
$b = 0.500000 - 0.866025I$		
$u = 1.024518 - 0.199293I$		
$a = -1.00451 - 2.33189I$	$-8.88264 - 4.05977I$	$-10.00000 + 6.92820I$
$b = 0.500000 - 0.866025I$		
$u = 1.024518 + 0.199293I$		
$a = -1.00451 + 2.33189I$	$-8.88264 + 4.05977I$	$-10.00000 - 6.92820I$
$b = 0.500000 + 0.866025I$		

IX. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1, c_7	$u^2(u^2 - u - 1)^{14}(u^2 + u - 1)(u^6 + 4u^5 + 6u^4 + 5u^3 + 5u^2 + 6u + 4)^2$ $(u^{13} + 6u^{12} + \dots - 20u - 8)$ $(u^{16} - 9u^{14} + 35u^{12} - 82u^{10} + 133u^8 - 152u^6 + 118u^4 - 56u^2 + 13)$
c_2	$u^2(u^2 + 3u + 1)^{15}(u^6 + 4u^5 + 6u^4 + 5u^3 + 13u^2 - 4u + 16)^2$ $(u^8 + 9u^7 + 35u^6 + 82u^5 + 133u^4 + 152u^3 + 118u^2 + 56u + 13)^2$ $(u^{13} + 10u^{12} + \dots + 208u + 64)$
c_3, c_5, c_8 c_{10}	$(u^2 - u - 1)(u^2 + u + 1)(u^4 + u^3 - 2u^2 + 2u - 1)$ $(u^8 - u^7 - 2u^6 + 3u^5 + 10u^4 + 7u^3 - 3u^2 + 4)$ $(u^{12} - u^{10} + 4u^8 + 8u^7 + 14u^6 - 15u^5 - 33u^4 - u^3 + 26u^2 - 3u + 1)$ $(u^{13} + u^{12} + \dots + u + 1)(u^{16} - u^{15} + \dots + u + 1)$ $(u^{16} + u^{15} + \dots - 14u + 61)$
c_4, c_9	$(u^2 - u - 1)(u^2 - u + 1)(u^2 + u - 1)^2(1 + 4u^2 + u^3 + 3u^4 + u^5 + u^6)^2$ $(u^8 - 3u^7 + 8u^6 - 3u^5 + 8u^4 - 3u^3 + 7u^2 + 16)$ $(u^8 + u^7 - u^5 - 3u^4 + u^3 + 4u^2 + u + 1)^2$ $(u^8 + u^7 + 2u^6 - 5u^5 - 2u^4 + 11u^3 + 5u^2 + 2u + 4)^2$ $(u^{13} - 2u^{12} + \dots - u + 4)$
c_6, c_{11}	$u^2(u + 1)^4(u^2 - u + 1)(u^2 + u + 1)^4(u^4 + u^3 - 2u + 1)^4$ $(u^{12} - 4u^{11} + \dots - 66u + 11)(u^{13} - 5u^{12} + \dots + 11u + 1)$ $(u^{16} - 9u^{15} + \dots - 6u + 1)$

X. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_7	$y^2(y^2 - 3y + 1)^{15}(y^6 - 4y^5 + 6y^4 - 5y^3 + 13y^2 + 4y + 16)^2$ $(y^8 - 9y^7 + 35y^6 - 82y^5 + 133y^4 - 152y^3 + 118y^2 - 56y + 13)^2$ $(y^{13} - 10y^{12} + \dots + 208y - 64)$
c_2	$y^2(y^2 - 7y + 1)^{15}(y^6 - 4y^5 + 22y^4 + 195y^3 + 401y^2 + 400y + 256)^2$ $(y^8 - 11y^7 + 15y^6 + 86y^5 + 39y^4 + 10y^3 + 358y^2 - 68y + 169)^2$ $(y^{13} - 14y^{12} + \dots - 14080y - 4096)$
c_3, c_5, c_8 c_{10}	$(y^2 - 3y + 1)(y^2 + y + 1)(y^4 - 5y^3 - 2y^2 + 1)$ $(y^8 - 5y^7 + 30y^6 - 41y^5 + 78y^4 - 125y^3 + 89y^2 - 24y + 16)$ $(y^{12} - 2y^{11} + \dots + 43y + 1)(y^{13} - 13y^{12} + \dots + 21y - 1)$ $(y^{16} + 9y^{15} + \dots + y + 1)(y^{16} + 13y^{15} + \dots + 5172y + 3721)$
c_4, c_9	$(y^2 - 3y + 1)^3(y^2 + y + 1)(1 + 8y + 22y^2 + 25y^3 + 15y^4 + 5y^5 + y^6)^2$ $(y^8 - y^7 - 4y^6 + 5y^5 + 11y^4 - 23y^3 + 8y^2 + 7y + 1)^2$ $(y^8 + 3y^7 + 10y^6 - 45y^5 + 138y^4 - 105y^3 - 35y^2 + 36y + 16)^2$ $(y^8 + 7y^7 + 62y^6 + 115y^5 + 190y^4 + 359y^3 + 305y^2 + 224y + 256)$ $(y^{13} + 16y^{11} + \dots + 65y - 16)$
c_6, c_{11}	$y^2(y - 1)^4(y^2 + y + 1)^5(y^4 - y^3 + 6y^2 - 4y + 1)^4$ $(y^{12} - 4y^{11} + \dots - 484y + 121)(y^{13} - 5y^{12} + \dots + 157y - 1)$ $(y^{16} - 9y^{15} + \dots - 2y + 1)$