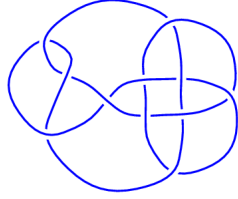
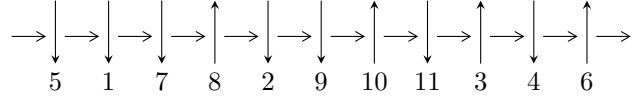


11a₁₇₁ (K11a₁₇₁)

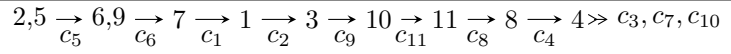


1

Arc Sequences



Solving Sequence



Representation Ideals

$$I = \bigcap_{i=1}^4 I_i^u \bigcap I_1^v$$

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

$$I_2^u = \langle u^{16} + 2u^{15} - 2u^{14} - 8u^{13} - u^{12} + 14u^{11} + 10u^{10} - 11u^9 - 15u^8 + u^7 + 11u^6 + 6u^5 - 2u^4 - 4u^3 + 2u + 1, \\ u^{15} - u^{14} - 4u^{13} + 2u^{12} + 10u^{11} - 2u^{10} - 14u^9 - 2u^8 + 12u^7 + 4u^6 - 3u^5 - 4u^4 - 2u^3 + 2u^2 + b + u - 1, \\ 2u^{15} + 4u^{14} + \dots + a + 3 \rangle$$

$$I_3^u = \langle a^{62} - 5a^{60} + \dots - 41640182a + 1319939, \\ 4.63091 \times 10^{449}u - 6.79296 \times 10^{443}a^{61} + \dots - 2.17373 \times 10^{452}a + 1.17964 \times 10^{451}, \\ 1.75511 \times 10^{452}b - 7.56804 \times 10^{445}a^{61} + \dots - 2.41348 \times 10^{454}a + 1.40045 \times 10^{453} \rangle$$

$$I_4^u = \langle u^{46} - 5u^{45} + \dots - 5u + 1, 409894u^{45} - 1529480u^{44} + \dots + 69383a - 210129, \\ - 756529u^{45} + 2769060u^{44} + \dots + 69383b + 430369 \rangle$$

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

There are 5 irreducible components with 127 representations.

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

$$\text{I. } \Gamma_1^u = \langle a^2 - a - 1, u - 1, b + a + 1 \rangle$$

(i) Arc colorings

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

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

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

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

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

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

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

$$a_{10} = \begin{pmatrix} a \\ -2a - 1 \end{pmatrix}$$

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

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

$$a_4 = \begin{pmatrix} a - 2 \\ 2 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} a - 2 \\ 2 \end{pmatrix}$$

(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
$u = 1.00000$ $a = -0.618034$ $b = -0.381966$	-3.28987	-17.0000
$u = 1.00000$ $a = 1.61803$ $b = -2.61803$	-3.28987	-17.0000

$$I_2^u = \langle u^{16} + 2u^{15} + \dots + 2u + 1, u^{15} - u^{14} + \dots + b - 1, 2u^{15} + 4u^{14} + \dots + a + 3 \rangle$$

II.

(i) Arc colorings

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

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

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

$$a_9 = \begin{pmatrix} -2u^{15} - 4u^{14} + \dots - 3u - 3 \\ -u^{15} + u^{14} + \dots - u + 1 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -u^{15} - 3u^{14} + \dots - u - 4 \\ -u^{15} + 3u^{13} + \dots + u^2 + 1 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -u^2 + 1 \\ u^4 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -u^{15} - 2u^{14} + \dots - u - 1 \\ -u^{15} + 4u^{13} + \dots - u^2 - 2u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} u^4 - u^2 + 1 \\ -u^4 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -u^{15} - 2u^{14} + \dots - u - 2 \\ u^{14} + u^{13} + \dots - 2u^2 + 1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 3u^{15} + 3u^{14} + \dots + 4u + 2 \\ -3u^{15} - 4u^{14} + \dots - 3u - 3 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 3u^{15} + 3u^{14} + \dots + 4u + 2 \\ -3u^{15} - 4u^{14} + \dots - 3u - 3 \end{pmatrix}$$

(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
$u = -1.151853 - 0.528952I$ $a = -1.78773 - 0.12345I$ $b = 2.79766 + 0.54759I$	$-3.34287 - 9.35884I$	$-5.15004 + 8.71081I$
$u = -1.151853 + 0.528952I$ $a = -1.78773 + 0.12345I$ $b = 2.79766 - 0.54759I$	$-3.34287 + 9.35884I$	$-5.15004 - 8.71081I$
$u = -1.024365 - 0.459927I$ $a = 1.83150 + 0.28698I$ $b = -2.40940 - 1.33188I$	$-0.384219 + 0.628959I$	$-3.48364 - 2.80361I$
$u = -1.024365 + 0.459927I$ $a = 1.83150 - 0.28698I$ $b = -2.40940 + 1.33188I$	$-0.384219 - 0.628959I$	$-3.48364 + 2.80361I$
$u = -0.877768 - 0.808431I$ $a = -0.0157840 - 0.0653165I$ $b = 0.277512 - 0.092078I$	$3.87749 - 3.01517I$	$-33.6443 + 18.9911I$
$u = -0.877768 + 0.808431I$ $a = -0.0157840 + 0.0653165I$ $b = 0.277512 + 0.092078I$	$3.87749 + 3.01517I$	$-33.6443 - 18.9911I$
$u = -0.590891 - 0.389110I$ $a = 0.19688 + 2.25256I$ $b = 0.899899 - 0.946271I$	$1.05595 - 4.33077I$	$-0.04563 + 8.60569I$
$u = -0.590891 + 0.389110I$ $a = 0.19688 - 2.25256I$ $b = 0.899899 + 0.946271I$	$1.05595 + 4.33077I$	$-0.04563 - 8.60569I$
$u = -0.197391 - 0.752145I$ $a = -0.61989 - 1.71626I$ $b = -0.231089 + 0.506366I$	$-0.60305 + 4.58234I$	$-2.40249 - 6.00817I$
$u = -0.197391 + 0.752145I$ $a = -0.61989 + 1.71626I$ $b = -0.231089 - 0.506366I$	$-0.60305 - 4.58234I$	$-2.40249 + 6.00817I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.632624 - 0.437790I$ $a = 0.836076 + 0.294587I$ $b = -0.026066 - 1.061264I$	$1.10121 - 2.89037I$	$-1.29781 + 2.83273I$
$u = 0.632624 + 0.437790I$ $a = 0.836076 - 0.294587I$ $b = -0.026066 + 1.061264I$	$1.10121 + 2.89037I$	$-1.29781 - 2.83273I$
$u = 1.020343 - 0.486012I$ $a = -1.029157 - 0.452903I$ $b = 0.91414 + 1.41991I$	$-0.21632 + 6.81045I$	$-4.49677 - 10.12296I$
$u = 1.020343 + 0.486012I$ $a = -1.029157 + 0.452903I$ $b = 0.91414 - 1.41991I$	$-0.21632 - 6.81045I$	$-4.49677 + 10.12296I$
$u = 1.189300 - 0.317097I$ $a = 1.088110 + 0.049738I$ $b = -1.72266 - 0.70693I$	$-4.77806 - 1.04547I$	$-8.97927 + 2.31364I$
$u = 1.189300 + 0.317097I$ $a = 1.088110 - 0.049738I$ $b = -1.72266 + 0.70693I$	$-4.77806 + 1.04547I$	$-8.97927 - 2.31364I$

$$\text{III. } I_3^u = \langle a^{62} - 5a^{60} + \dots - 41640182a + 1319939, 4.63 \times 10^{449}u - 6.79 \times 10^{443}a^{61} + \dots - 2.17 \times 10^{452}a + 1.18 \times 10^{451}, 1.76 \times 10^{452}b - 7.57 \times 10^{445}a^{61} + \dots - 2.41 \times 10^{454}a + 1.40 \times 10^{453} \rangle$$

(i) Arc colorings

$$\begin{aligned} a_2 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_5 &= \begin{pmatrix} 0 \\ 1.46687 \times 10^{-6}a^{61} + 1.06141 \times 10^{-7}a^{60} + \dots + 469.397a - 25.4732 \end{pmatrix} \\ a_6 &= \begin{pmatrix} -1.46687 \times 10^{-6}a^{61} - 1.06141 \times 10^{-7}a^{60} + \dots - 469.397a + 25.4732 \\ 1.46687 \times 10^{-6}a^{61} + 1.06141 \times 10^{-7}a^{60} + \dots + 469.397a - 25.4732 \end{pmatrix} \\ a_9 &= \begin{pmatrix} a \\ 4.31199 \times 10^{-7}a^{61} + 3.09000 \times 10^{-8}a^{60} + \dots + 137.511a - 7.97928 \end{pmatrix} \\ a_7 &= \begin{pmatrix} -1.36963 \times 10^{-6}a^{61} - 1.02244 \times 10^{-7}a^{60} + \dots - 436.440a + 23.7012 \\ 2.87983 \times 10^{-7}a^{61} + 2.05858 \times 10^{-8}a^{60} + \dots + 90.9542a - 5.37044 \end{pmatrix} \\ a_1 &= \begin{pmatrix} 1 \\ 2.32647 \times 10^{-6}a^{61} + 1.74920 \times 10^{-7}a^{60} + \dots + 742.175a - 39.1627 \end{pmatrix} \\ a_3 &= \begin{pmatrix} 2.32647 \times 10^{-6}a^{61} + 1.74920 \times 10^{-7}a^{60} + \dots + 742.175a - 38.1627 \\ -7.17012 \times 10^{-7}a^{61} - 6.81558 \times 10^{-8}a^{60} + \dots - 215.868a + 10.0601 \end{pmatrix} \\ a_{10} &= \begin{pmatrix} -2.92181 \times 10^{-6}a^{61} - 2.07876 \times 10^{-7}a^{60} + \dots - 939.621a + 49.5755 \\ 2.58100 \times 10^{-6}a^{61} + 2.03100 \times 10^{-7}a^{60} + \dots + 812.321a - 42.6596 \end{pmatrix} \\ a_{11} &= \begin{pmatrix} 1.60945 \times 10^{-6}a^{61} + 1.06764 \times 10^{-7}a^{60} + \dots + 526.308a - 28.1026 \\ 7.17012 \times 10^{-7}a^{61} + 6.81558 \times 10^{-8}a^{60} + \dots + 215.868a - 10.0601 \end{pmatrix} \\ a_8 &= \begin{pmatrix} 5.77520 \times 10^{-7}a^{61} + 6.72879 \times 10^{-8}a^{60} + \dots + 162.359a - 7.77369 \\ -1.31112 \times 10^{-6}a^{61} - 1.04854 \times 10^{-7}a^{60} + \dots - 415.982a + 21.3926 \end{pmatrix} \\ a_4 &= \begin{pmatrix} -3.16453 \times 10^{-8}a^{61} - 1.78068 \times 10^{-8}a^{60} + \dots - 1.23768a + 0.576707 \\ 8.05075 \times 10^{-7}a^{61} + 5.04584 \times 10^{-8}a^{60} + \dots + 273.972a - 15.9451 \end{pmatrix} \\ a_4 &= \begin{pmatrix} -3.16453 \times 10^{-8}a^{61} - 1.78068 \times 10^{-8}a^{60} + \dots - 1.23768a + 0.576707 \\ 8.05075 \times 10^{-7}a^{61} + 5.04584 \times 10^{-8}a^{60} + \dots + 273.972a - 15.9451 \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
$u = -1.057022 + 0.392863I$ $a = -2.43314 - 0.54577I$ $b = 2.69526 + 0.95587I$	$-1.41458 - 1.86246I$	$-6.47152 + 4.51832I$
$u = -1.057022 - 0.392863I$ $a = -2.43314 + 0.54577I$ $b = 2.69526 - 0.95587I$	$-1.41458 + 1.86246I$	$-6.47152 - 4.51832I$
$u = 1.037233 + 0.490832I$ $a = -2.05442 - 0.53637I$ $b = 3.37617 + 0.87454I$	$0.442167 - 0.494118I$	$-0.11941 + 1.82079I$
$u = 1.037233 - 0.490832I$ $a = -2.05442 + 0.53637I$ $b = 3.37617 - 0.87454I$	$0.442167 + 0.494118I$	$-0.11941 - 1.82079I$
$u = -1.157762 - 0.512519I$ $a = -1.94037 - 0.36721I$ $b = 3.39713 + 0.70582I$	$-5.08886 - 9.19357I$	$-11.4929 + 8.9901I$
$u = -1.157762 + 0.512519I$ $a = -1.94037 + 0.36721I$ $b = 3.39713 - 0.70582I$	$-5.08886 + 9.19357I$	$-11.4929 - 8.9901I$
$u = 1.11799$ $a = -1.54119$ $b = 2.40394$	-2.94773	9.04294
$u = 1.229733 + 0.258953I$ $a = -1.41847 - 0.04576I$ $b = 2.14272 - 0.39708I$	$-3.97519 + 1.59170I$	$-1.35198 - 10.14097I$
$u = 1.229733 - 0.258953I$ $a = -1.41847 + 0.04576I$ $b = 2.14272 + 0.39708I$	$-3.97519 - 1.59170I$	$-1.35198 + 10.14097I$
$u = -1.171535 - 0.571368I$ $a = -1.201385 - 0.152379I$ $b = 2.09128 + 0.56024I$	$-1.82208 - 10.29011I$	$-1.64284 + 11.44923I$

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.171535 + 0.571368I$ $a = -1.201385 + 0.152379I$ $b = 2.09128 - 0.56024I$	$-1.82208 + 10.29011I$	$-1.64284 - 11.44923I$
$u = 1.178186 + 0.355689I$ $a = -1.15895 - 0.96635I$ $b = 1.74729 + 0.52652I$	$-6.17761 + 0.88062I$	$-14.6380 - 2.9072I$
$u = 1.178186 - 0.355689I$ $a = -1.15895 + 0.96635I$ $b = 1.74729 - 0.52652I$	$-6.17761 - 0.88062I$	$-14.6380 + 2.9072I$
$u = -0.168042 - 0.738886I$ $a = -0.92839 - 2.28845I$ $b = -0.022116 + 0.301969I$	$-2.24573 + 4.52331I$	$-8.41907 - 6.24640I$
$u = -0.168042 + 0.738886I$ $a = -0.92839 + 2.28845I$ $b = -0.022116 - 0.301969I$	$-2.24573 - 4.52331I$	$-8.41907 + 6.24640I$
$u = 1.037233 - 0.490832I$ $a = -0.771065 - 0.573122I$ $b = 0.869891 - 0.499254I$	$0.442167 + 0.494118I$	$-0.11941 - 1.82079I$
$u = 1.037233 + 0.490832I$ $a = -0.771065 + 0.573122I$ $b = 0.869891 + 0.499254I$	$0.442167 - 0.494118I$	$-0.11941 + 1.82079I$
$u = 0.467072 + 0.505817I$ $a = -0.64319 - 2.77959I$ $b = 0.178577 + 0.580009I$	$2.11162 - 3.64112I$	$4.51546 + 4.55522I$
$u = 0.467072 - 0.505817I$ $a = -0.64319 + 2.77959I$ $b = 0.178577 - 0.580009I$	$2.11162 + 3.64112I$	$4.51546 - 4.55522I$
$u = -0.483181 + 0.627527I$ $a = -0.61496 - 1.32926I$ $b = -0.212090 + 0.311787I$	$2.01990 - 0.90453I$	$3.65108 + 0.79331I$

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.483181 - 0.627527I$ $a = -0.61496 + 1.32926I$ $b = -0.212090 - 0.311787I$	$2.01990 + 0.90453I$	$3.65108 - 0.79331I$
$u = -0.168042 + 0.738886I$ $a = -0.59373 - 1.59457I$ $b = 0.782781 + 0.650895I$	$-2.24573 - 4.52331I$	$-8.41907 + 6.24640I$
$u = -0.168042 - 0.738886I$ $a = -0.59373 + 1.59457I$ $b = 0.782781 - 0.650895I$	$-2.24573 + 4.52331I$	$-8.41907 - 6.24640I$
$u = -0.271790 - 0.844936I$ $a = -0.507480 - 1.209593I$ $b = -0.194320 + 0.174273I$	$0.86287 + 5.06730I$	$2.75638 - 8.05298I$
$u = -0.271790 + 0.844936I$ $a = -0.507480 + 1.209593I$ $b = -0.194320 - 0.174273I$	$0.86287 - 5.06730I$	$2.75638 + 8.05298I$
$u = 1.11799$ $a = -0.350438$ $b = -0.317798$	-2.94773	9.04294
$u = 0.467072 + 0.505817I$ $a = -0.190163 - 0.921127I$ $b = -1.37742 + 0.43065I$	$2.11162 - 3.64112I$	$4.51546 + 4.55522I$
$u = 0.467072 - 0.505817I$ $a = -0.190163 + 0.921127I$ $b = -1.37742 - 0.43065I$	$2.11162 + 3.64112I$	$4.51546 - 4.55522I$
$u = -0.790665 - 0.695036I$ $a = 0.0796411 - 0.0038592I$ $b = -0.760027 - 0.202385I$	$3.79486 - 2.62922I$	$6.53544 + 4.19495I$
$u = -0.790665 + 0.695036I$ $a = 0.0796411 + 0.0038592I$ $b = -0.760027 + 0.202385I$	$3.79486 + 2.62922I$	$6.53544 - 4.19495I$

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.271790 + 0.844936I$		
$a = 0.19575 - 1.81853I$	$0.86287 - 5.06730I$	$2.75638 + 8.05298I$
$b = 0.087960 + 0.559361I$		
$u = -0.271790 - 0.844936I$		
$a = 0.19575 + 1.81853I$	$0.86287 + 5.06730I$	$2.75638 - 8.05298I$
$b = 0.087960 - 0.559361I$		
$u = -0.790665 + 0.695036I$		
$a = 0.209439 - 0.420689I$	$3.79486 + 2.62922I$	$6.53544 - 4.19495I$
$b = 0.224565 - 0.075780I$		
$u = -0.790665 - 0.695036I$		
$a = 0.209439 + 0.420689I$	$3.79486 - 2.62922I$	$6.53544 + 4.19495I$
$b = 0.224565 + 0.075780I$		
$u = -1.026552 + 0.519350I$		
$a = 0.246653 - 0.578430I$	$0.44756 + 5.41860I$	$-0.32653 - 5.88711I$
$b = 0.136144 - 0.054712I$		
$u = -1.026552 - 0.519350I$		
$a = 0.246653 + 0.578430I$	$0.44756 - 5.41860I$	$-0.32653 + 5.88711I$
$b = 0.136144 + 0.054712I$		
$u = -0.483181 + 0.627527I$		
$a = 0.277011 - 0.173898I$	$2.01990 - 0.90453I$	$3.65108 + 0.79331I$
$b = -0.662449 + 0.543286I$		
$u = -0.483181 - 0.627527I$		
$a = 0.277011 + 0.173898I$	$2.01990 + 0.90453I$	$3.65108 - 0.79331I$
$b = -0.662449 - 0.543286I$		
$u = 1.094170 - 0.506739I$		
$a = 0.429963 - 0.931241I$	$-0.54438 + 8.91512I$	$-2.96887 - 11.01596I$
$b = -0.75145 + 2.66623I$		
$u = 1.094170 + 0.506739I$		
$a = 0.429963 + 0.931241I$	$-0.54438 - 8.91512I$	$-2.96887 + 11.01596I$
$b = -0.75145 - 2.66623I$		

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.753184 - 0.319413I$ $a = 0.50427 - 1.78730I$ $b = -0.64697 + 2.15657I$	$-0.12340 - 4.63553I$	$-7.19066 + 8.64807I$
$u = -0.753184 + 0.319413I$ $a = 0.50427 + 1.78730I$ $b = -0.64697 - 2.15657I$	$-0.12340 + 4.63553I$	$-7.19066 - 8.64807I$
$u = -0.753184 + 0.319413I$ $a = 0.574105 - 1.283487I$ $b = 0.686369 - 0.034168I$	$-0.12340 + 4.63553I$	$-7.19066 - 8.64807I$
$u = -0.753184 - 0.319413I$ $a = 0.574105 + 1.283487I$ $b = 0.686369 + 0.034168I$	$-0.12340 - 4.63553I$	$-7.19066 + 8.64807I$
$u = 1.229733 + 0.258953I$ $a = 0.574647 - 0.220052I$ $b = -1.120433 + 0.822844I$	$-3.97519 + 1.59170I$	$-1.35198 - 10.14097I$
$u = 1.229733 - 0.258953I$ $a = 0.574647 + 0.220052I$ $b = -1.120433 - 0.822844I$	$-3.97519 - 1.59170I$	$-1.35198 + 10.14097I$
$u = -1.057022 + 0.392863I$ $a = 0.714448 - 0.757121I$ $b = -1.29741 + 2.38718I$	$-1.41458 - 1.86246I$	$-6.47152 + 4.51832I$
$u = -1.057022 - 0.392863I$ $a = 0.714448 + 0.757121I$ $b = -1.29741 - 2.38718I$	$-1.41458 + 1.86246I$	$-6.47152 - 4.51832I$
$u = 0.314340 - 0.572965I$ $a = 0.76574 - 2.62474I$ $b = -0.201731 + 1.318463I$	$1.67219 - 4.56405I$	$2.14197 + 7.53125I$
$u = 0.314340 + 0.572965I$ $a = 0.76574 + 2.62474I$ $b = -0.201731 - 1.318463I$	$1.67219 + 4.56405I$	$2.14197 - 7.53125I$

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.178186 + 0.355689I$		
$a = 1.32688 - 0.67944I$	$-6.17761 + 0.88062I$	$-14.6380 - 2.9072I$
$b = -2.26915 + 1.59970I$		
$u = 1.178186 - 0.355689I$		
$a = 1.32688 + 0.67944I$	$-6.17761 - 0.88062I$	$-14.6380 + 2.9072I$
$b = -2.26915 - 1.59970I$		
$u = -1.026552 - 0.519350I$		
$a = 1.35631 - 0.43247I$	$0.44756 - 5.41860I$	$-0.32653 + 5.88711I$
$b = -2.19532 + 1.02850I$		
$u = -1.026552 + 0.519350I$		
$a = 1.35631 + 0.43247I$	$0.44756 + 5.41860I$	$-0.32653 - 5.88711I$
$b = -2.19532 - 1.02850I$		
$u = -1.157762 - 0.512519I$		
$a = 1.69383 - 0.86714I$	$-5.08886 - 9.19357I$	$-11.4929 + 8.9901I$
$b = -2.30669 + 0.75531I$		
$u = -1.157762 + 0.512519I$		
$a = 1.69383 + 0.86714I$	$-5.08886 + 9.19357I$	$-11.4929 - 8.9901I$
$b = -2.30669 - 0.75531I$		
$u = -1.171535 + 0.571368I$		
$a = 1.76811 - 0.05465I$	$-1.82208 + 10.29011I$	$-1.64284 - 11.44923I$
$b = -2.74116 + 0.10746I$		
$u = -1.171535 - 0.571368I$		
$a = 1.76811 + 0.05465I$	$-1.82208 - 10.29011I$	$-1.64284 + 11.44923I$
$b = -2.74116 - 0.10746I$		
$u = 0.314340 - 0.572965I$		
$a = 2.17131 - 0.57044I$	$1.67219 - 4.56405I$	$2.14197 + 7.53125I$
$b = 0.571185 + 0.026600I$		
$u = 0.314340 + 0.572965I$		
$a = 2.17131 + 0.57044I$	$1.67219 + 4.56405I$	$2.14197 - 7.53125I$
$b = 0.571185 - 0.026600I$		
Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.094170 - 0.506739I$		
$a = 2.51343 - 0.71210I$	$-0.54438 + 8.91512I$	$-2.96887 - 11.01596I$
$b = -3.27165 + 0.91207I$		
$u = 1.094170 + 0.506739I$		
$a = 2.51343 + 0.71210I$	$-0.54438 - 8.91512I$	$-2.96887 + 11.01596I$
$b = -3.27165 - 0.91207I$		

IV.

$$I_4^u = \langle u^{46} - 5u^{45} + \dots - 5u + 1, 4.10 \times 10^5 u^{45} - 1.53 \times 10^6 u^{44} + \dots + 6.94 \times 10^4 a - 2.10 \times 10^5, -7.57 \times 10^5 u^{45} + 2.77 \times 10^6 u^{44} + \dots + 6.94 \times 10^4 b + 4.30 \times 10^5 \rangle$$

(i) Arc colorings

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

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

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

$$a_9 = \begin{pmatrix} -5.90770u^{45} + 22.0440u^{44} + \dots - 12.0178u + 3.02854 \\ 10.9037u^{45} - 39.9098u^{44} + \dots + 30.1036u - 6.20280 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -5.54479u^{45} + 22.2577u^{44} + \dots - 11.8700u + 3.05705 \\ 13.3044u^{45} - 52.8398u^{44} + \dots + 43.3909u - 8.99833 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -u^2 + 1 \\ u^4 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -5.54479u^{45} + 22.2577u^{44} + \dots - 13.8700u + 4.05705 \\ 9.01675u^{45} - 34.8571u^{44} + \dots + 31.0442u - 6.82680 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} u^4 - u^2 + 1 \\ -u^4 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -1.62373u^{45} + 5.57638u^{44} + \dots + 6.33544u - 0.748123 \\ 2.91541u^{45} - 13.6934u^{44} + \dots + 16.9255u - 4.24914 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -6.23964u^{45} + 24.4501u^{44} + \dots - 9.52363u + 3.36251 \\ 7.16070u^{45} - 30.1314u^{44} + \dots + 28.7291u - 6.16768 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -6.23964u^{45} + 24.4501u^{44} + \dots - 9.52363u + 3.36251 \\ 7.16070u^{45} - 30.1314u^{44} + \dots + 28.7291u - 6.16768 \end{pmatrix}$$

(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
$u = -1.225337 - 0.349011I$		
$a = 0.889993 + 0.576468I$	$-6.99619 - 7.57481I$	$-10.39877 + 7.23305I$
$b = -1.67770 - 0.41554I$		
$u = -1.225337 + 0.349011I$		
$a = 0.889993 - 0.576468I$	$-6.99619 + 7.57481I$	$-10.39877 - 7.23305I$
$b = -1.67770 + 0.41554I$		
$u = -1.215534 - 0.243371I$		
$a = 1.46792 - 0.19964I$	$-5.60396 + 10.10355I$	$-8.00817 - 5.63549I$
$b = -2.42629 + 1.03642I$		
$u = -1.215534 + 0.243371I$		
$a = 1.46792 + 0.19964I$	$-5.60396 - 10.10355I$	$-8.00817 + 5.63549I$
$b = -2.42629 - 1.03642I$		
$u = -1.135203 - 0.294115I$		
$a = -1.50669 + 0.02427I$	$-6.20814 + 1.80497I$	$-14.2464 - 4.3963I$
$b = 2.52069 - 1.05527I$		
$u = -1.135203 + 0.294115I$		
$a = -1.50669 - 0.02427I$	$-6.20814 - 1.80497I$	$-14.2464 + 4.3963I$
$b = 2.52069 + 1.05527I$		
$u = -1.112296 - 0.261314I$		
$a = -0.924409 - 0.656226I$	$-5.91551 - 1.58146I$	$-13.59206 + 3.66934I$
$b = 2.10936 + 0.51254I$		
$u = -1.112296 + 0.261314I$		
$a = -0.924409 + 0.656226I$	$-5.91551 + 1.58146I$	$-13.59206 - 3.66934I$
$b = 2.10936 - 0.51254I$		
$u = -1.099343 - 0.465407I$		
$a = -1.34416 - 0.55405I$	$-4.10186 - 3.81474I$	$-9.79702 + 3.58298I$
$b = 2.21094 - 0.22704I$		
$u = -1.099343 + 0.465407I$		
$a = -1.34416 + 0.55405I$	$-4.10186 + 3.81474I$	$-9.79702 - 3.58298I$
$b = 2.21094 + 0.22704I$		

Solution to I_4^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.059213 - 0.534264I$		
$a = 0.779953 + 0.039391I$	$0.17597 - 5.33365I$	$-1.16724 + 4.83689I$
$b = -0.983029 + 0.522661I$		
$u = -1.059213 + 0.534264I$		
$a = 0.779953 - 0.039391I$	$0.17597 + 5.33365I$	$-1.16724 - 4.83689I$
$b = -0.983029 - 0.522661I$		
$u = -0.881986 - 0.787307I$		
$a = 0.108733 + 0.190174I$	$3.98279 - 2.95487I$	$23.7349 - 13.5735I$
$b = -0.212790 - 0.101868I$		
$u = -0.881986 + 0.787307I$		
$a = 0.108733 - 0.190174I$	$3.98279 + 2.95487I$	$23.7349 + 13.5735I$
$b = -0.212790 + 0.101868I$		
$u = -0.431319 - 0.618019I$		
$a = -0.209693 + 0.745628I$	$2.00312 + 0.77598I$	$3.08048 - 0.37837I$
$b = -0.398515 - 0.405749I$		
$u = -0.431319 + 0.618019I$		
$a = -0.209693 - 0.745628I$	$2.00312 - 0.77598I$	$3.08048 + 0.37837I$
$b = -0.398515 + 0.405749I$		
$u = -0.092447 - 0.293184I$		
$a = 0.52277 - 3.36851I$	$-1.65225 + 0.00944I$	$-6.31613 + 0.26061I$
$b = 0.998318 + 0.214289I$		
$u = -0.092447 + 0.293184I$		
$a = 0.52277 + 3.36851I$	$-1.65225 - 0.00944I$	$-6.31613 - 0.26061I$
$b = 0.998318 - 0.214289I$		
$u = 0.132938 - 0.848595I$		
$a = 0.506025 + 1.047423I$	$-2.72587 + 3.54069I$	$-7.48667 - 4.84167I$
$b = -0.346355 - 0.193036I$		
$u = 0.132938 + 0.848595I$		
$a = 0.506025 - 1.047423I$	$-2.72587 - 3.54069I$	$-7.48667 + 4.84167I$
$b = -0.346355 + 0.193036I$		

Solution to I_4^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.278150 - 0.732712I$ $a = 0.25962 - 2.50961I$ $b = 0.470814 + 0.494010I$	$-2.03242 - 4.83583I$	$-8.60020 + 6.83106I$
$u = 0.278150 + 0.732712I$ $a = 0.25962 + 2.50961I$ $b = 0.470814 - 0.494010I$	$-2.03242 + 4.83583I$	$-8.60020 - 6.83106I$
$u = 0.291347 - 0.840599I$ $a = -0.29205 + 2.23800I$ $b = -0.249354 - 0.477451I$	$-0.71987 - 13.43224I$	$-2.36696 + 7.45298I$
$u = 0.291347 + 0.840599I$ $a = -0.29205 - 2.23800I$ $b = -0.249354 + 0.477451I$	$-0.71987 + 13.43224I$	$-2.36696 - 7.45298I$
$u = 0.375652 - 0.726957I$ $a = -0.89998 - 1.19100I$ $b = 0.342880 - 0.053077I$	$-1.60276 - 0.98411I$	$-7.53408 + 0.28472I$
$u = 0.375652 + 0.726957I$ $a = -0.89998 + 1.19100I$ $b = 0.342880 + 0.053077I$	$-1.60276 + 0.98411I$	$-7.53408 - 0.28472I$
$u = 0.660174 - 0.548978I$ $a = -0.803478 + 1.008650I$ $b = -0.602150 - 0.749555I$	$-0.36479 + 3.45703I$	$-5.70781 - 7.10352I$
$u = 0.660174 + 0.548978I$ $a = -0.803478 - 1.008650I$ $b = -0.602150 + 0.749555I$	$-0.36479 - 3.45703I$	$-5.70781 + 7.10352I$
$u = 0.751399 - 0.721194I$ $a = 0.478297 - 0.175669I$ $b = 0.754387 + 0.217576I$	$1.87378 + 10.77038I$	$-1.30875 - 9.40079I$
$u = 0.751399 + 0.721194I$ $a = 0.478297 + 0.175669I$ $b = 0.754387 - 0.217576I$	$1.87378 - 10.77038I$	$-1.30875 + 9.40079I$

Solution to I_4^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.761418 - 0.115983I$ $a = -0.927965 + 0.592492I$ $b = 0.583546 - 0.562150I$	$-1.37145 + 0.34774I$	$-7.35312 - 1.68014I$
$u = 0.761418 + 0.115983I$ $a = -0.927965 - 0.592492I$ $b = 0.583546 + 0.562150I$	$-1.37145 - 0.34774I$	$-7.35312 + 1.68014I$
$u = 0.856947 - 0.701617I$ $a = 0.164084 + 0.010834I$ $b = -0.016618 + 0.945437I$	$1.57181 - 5.40355I$	$-1.95277 + 5.01520I$
$u = 0.856947 + 0.701617I$ $a = 0.164084 - 0.010834I$ $b = -0.016618 - 0.945437I$	$1.57181 + 5.40355I$	$-1.95277 - 5.01520I$
$u = 0.933486 - 0.444661I$ $a = -1.082134 + 0.208292I$ $b = 1.12610 - 0.98739I$	$-1.098383 + 0.644192I$	$-5.70718 - 0.44366I$
$u = 0.933486 + 0.444661I$ $a = -1.082134 - 0.208292I$ $b = 1.12610 + 0.98739I$	$-1.098383 - 0.644192I$	$-5.70718 + 0.44366I$
$u = 1.099787 - 0.438913I$ $a = 1.65875 + 0.88034I$ $b = -2.61585 - 0.70206I$	$-4.28647 + 3.53114I$	$-10.17349 - 4.71484I$
$u = 1.099787 + 0.438913I$ $a = 1.65875 - 0.88034I$ $b = -2.61585 + 0.70206I$	$-4.28647 - 3.53114I$	$-10.17349 + 4.71484I$
$u = 1.115386 - 0.573899I$ $a = 1.045263 + 0.757916I$ $b = -1.97867 - 1.06928I$	$-3.77845 + 5.97580I$	$-9.62613 - 4.25022I$
$u = 1.115386 + 0.573899I$ $a = 1.045263 - 0.757916I$ $b = -1.97867 + 1.06928I$	$-3.77845 - 5.97580I$	$-9.62613 + 4.25022I$

Solution to I_4^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.133412 - 0.543345I$ $a = 2.20160 + 0.17621I$ $b = -3.62113 + 0.20485I$	$-4.51494 + 9.66961I$	$-12.1786 - 10.5958I$
$u = 1.133412 + 0.543345I$ $a = 2.20160 - 0.17621I$ $b = -3.62113 - 0.20485I$	$-4.51494 - 9.66961I$	$-12.1786 + 10.5958I$
$u = 1.165266 - 0.576600I$ $a = -2.02141 - 0.01612I$ $b = 3.34456 - 0.20372I$	$-3.3293 + 18.6712I$	$-5.27812 - 10.80266I$
$u = 1.165266 + 0.576600I$ $a = -2.02141 + 0.01612I$ $b = 3.34456 + 0.20372I$	$-3.3293 - 18.6712I$	$-5.27812 + 10.80266I$
$u = 1.197318 - 0.502148I$ $a = -1.071045 - 0.441986I$ $b = 1.66684 + 0.51223I$	$-5.94279 + 1.33870I$	$-10.51571 + 0.17082I$
$u = 1.197318 + 0.502148I$ $a = -1.071045 + 0.441986I$ $b = 1.66684 - 0.51223I$	$-5.94279 - 1.33870I$	$-10.51571 - 0.17082I$

$$\mathbf{V. } I_1^v = \langle b - 1, v - 1, a \rangle$$

(i) Arc colorings

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

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

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

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

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

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

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

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

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

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

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

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

(ii) Obstruction class = -1

(iii) Cusp Shapes =unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_1^v	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$v = 1.00000$		
$a = 0$	-1.64493	-6.00000
$b = 1.00000$		

VI. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1	$(u)(u-1)^2(u^{16} + 2u^{15} + \dots + 2u + 1)$ $(1 - 2u + u^2 + 4u^4 - 8u^5 + 16u^7 - 10u^8 - 20u^9 + 18u^{10} + 48u^{11} - 70u^{12} - 60u^{13} + 184u^{14} - \dots)$ $(u^{46} + 5u^{45} + \dots + 5u + 1)$
c_2	$(u)(u+1)^2(u^{16} + 8u^{15} + \dots + 4u + 1)$ $(1 + 2u + 9u^2 + 24u^3 + 60u^4 + 128u^5 + 264u^6 + 444u^7 + 670u^8 + 1092u^9 + 2058u^{10} + 4076u^{11} - \dots)$ $(u^{46} + 23u^{45} + \dots - 11u + 1)$
c_3, c_{10}	$(u+1)(u^2 - u - 1)(u^{16} + 4u^{14} + \dots + u + 1)(u^{46} - u^{45} + \dots + 2u + 1)$ $(u^{62} + 2u^{61} + \dots + u - 1)$
c_4, c_9	$(u+1)(u^2 - u - 1)(u^{16} - u^{15} + \dots + 4u^2 + 1)(u^{46} - 2u^{45} + \dots + u + 1)$ $(u^{62} + 2u^{61} + \dots - 211u + 31)$
c_5	$(u)(u+1)^2(u^{16} - 2u^{15} + \dots - 2u + 1)$ $(1 - 2u + u^2 + 4u^4 - 8u^5 + 16u^7 - 10u^8 - 20u^9 + 18u^{10} + 48u^{11} - 70u^{12} - 60u^{13} + 184u^{14} - \dots)$ $(u^{46} + 5u^{45} + \dots + 5u + 1)$
c_6, c_8	$(u-1)^2(u+1)(u^{16} - 5u^{15} + \dots - 8u + 1)(u^{46} + 6u^{45} + \dots - 9u + 1)$ $(u^{62} - 3u^{61} + \dots + 378u - 49)$
c_7	$u^3(u^{16} + 11u^{15} + \dots + 38u + 5)$ $(2 + 3u - 15u^2 - 32u^3 + 32u^4 + 168u^5 + 100u^6 - 400u^7 - 792u^8 + 14u^9 + 1862u^{10} + 2316u^{11} - \dots)$ $(u^{46} - 26u^{45} + \dots - u + 1)$
c_{11}	$u^3(u^{16} + 6u^{15} + \dots + 14u + 5)(u^{46} - 15u^{45} + \dots - 1885u + 149)$ $(u^{62} + 18u^{61} + \dots + 1168u + 64)$

VII. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_5	$(y)(y-1)^2(y^{16} - 8y^{15} + \dots - 4y + 1)$ $(-1 + 2y - 9y^2 + 24y^3 - 60y^4 + 128y^5 - 264y^6 + 444y^7 - 670y^8 + 1092y^9 - 2058y^{10} + 4076y^{11} - 672y^{12} + 84y^{13} - 4y^{14} + 1)$ $(y^{46} - 23y^{45} + \dots + 11y + 1)$
c_2	$(y)(y-1)^2(y^{16} + 4y^{15} + \dots + 8y + 1)$ $(-1 - 14y - 105y^2 - 520y^3 - 1772y^4 - 5792y^5 - 2.05 \times 10^4 y^6 - 5.73 \times 10^4 y^7 - 1.42 \times 10^5 y^8 + 2.05 \times 10^4 y^9 - 5.73 \times 10^4 y^{10} - 1.42 \times 10^5 y^{11} + 2.05 \times 10^4 y^{12} - 5.73 \times 10^4 y^{13} - 1.42 \times 10^5 y^{14} + 1)$ $(y^{46} + 5y^{45} + \dots - 73y + 1)$
c_3	$(y-1)(y^2 - 3y + 1)(y^{16} + 8y^{15} + \dots + 5y + 1)$ $(y^{46} - 19y^{45} + \dots - 52y + 1)(y^{62} + 12y^{61} + \dots + 29y + 1)$
c_4	$(y-1)(y^2 - 3y + 1)(y^{16} + 5y^{15} + \dots + 8y + 1)(y^{46} - 2y^{45} + \dots + 27y + 1)$ $(y^{62} + 58y^{60} + \dots - 104599y + 961)$
c_6, c_8	$(y-1)^3(y^{16} + 9y^{15} + \dots - 8y + 1)(y^{46} - 30y^{45} + \dots - 121y + 1)$ $(y^{62} + 13y^{61} + \dots + 17738y + 2401)$
c_7	$y^3(y^{16} + 3y^{15} + \dots + 126y + 25)(y^{46} + 38y^{44} + \dots + 49y + 1)$ $(y^{62} - 6y^{61} + \dots - 552y + 16)$
c_9	$(y-1)(y^2 - 3y + 1)(y^{16} + 5y^{15} + \dots + 8y + 1)(y^{46} - 2y^{45} + \dots + 27y + 1)$ $(y^{62} + 58y^{60} + \dots - 104599y + 961)$
c_{10}	$(y-1)(y^2 - 3y + 1)(y^{16} + 8y^{15} + \dots + 5y + 1)$ $(y^{46} - 19y^{45} + \dots - 52y + 1)(y^{62} + 12y^{61} + \dots + 29y + 1)$
c_{11}	$y^3(y^{16} - 6y^{14} + \dots - 106y + 25)$ $(y^{46} + 13y^{45} + \dots + 238229y + 22201)$ $(y^{62} + 26y^{61} + \dots - 106624y + 4096)$