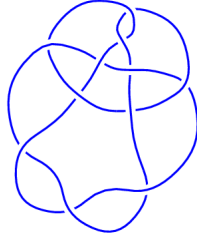
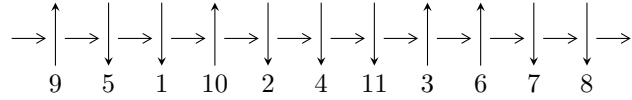


11a₂₇₇ (K11a₂₇₇)

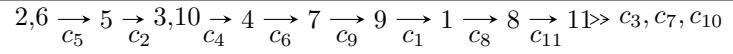


1

Arc Sequences



Solving Sequence



Representation Ideals

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

$$I_1^u = \langle a^4 + 3a^2 - 2a + 2, a^3 + a^2 + 2a + 2u, -a^3 + a^2 + 2b - 4a + 4 \rangle$$

$$I_2^u = \langle u^{12} - 6u^{11} + 20u^{10} - 46u^9 + 77u^8 - 98u^7 + 95u^6 - 71u^5 + 42u^4 - 21u^3 + 10u^2 - 3u + 1, \\ -u^{11} + 5u^{10} - 14u^9 + 26u^8 - 31u^7 + 22u^6 - u^5 - 15u^4 + 15u^3 - 7u^2 + a + u - 2, \\ -u^{11} + 6u^{10} - 20u^9 + 45u^8 - 72u^7 + 85u^6 - 72u^5 + 43u^4 - 18u^3 + 6u^2 + b - 3u \rangle$$

$$I_3^u = \langle 9a^{48} - 9a^{47} + \dots - 2a + 2, 1.21913 \times 10^{111}u - 1.27326 \times 10^{112}a^{47} + \dots + 1.81903 \times 10^{112}a - 2.03749 \times 10^{110} \\ 6.09567 \times 10^{110}b + 4.72246 \times 10^{112}a^{47} + \dots + 1.84803 \times 10^{112}a - 6.43436 \times 10^{110} \rangle$$

$$I_4^u = \langle u^{35} + 9u^{34} + \dots + 129u + 8, 5.73272 \times 10^{21}u^{34} + 5.78933 \times 10^{22}u^{33} + \dots + 1.46127 \times 10^{23}b + 3.04671 \times 10^{23} \\ 1.58974 \times 10^{23}u^{34} + 1.57646 \times 10^{24}u^{33} + \dots + 1.16902 \times 10^{24}a + 1.93433 \times 10^{25} \rangle$$

There are 4 irreducible components with 99 representations.

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

$$\text{I. } \Gamma_1^u = \langle a^4 + 3a^2 - 2a + 2, a^3 + a^2 + 2a + 2u, -a^3 + a^2 + 2b - 4a + 4 \rangle$$

(i) Arc colorings

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

$$a_6 = \begin{pmatrix} 0 \\ -\frac{1}{2}a^3 - \frac{1}{2}a^2 - a \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -\frac{1}{2}a^3 - \frac{1}{2}a^2 - a \\ -\frac{1}{2}a^3 - \frac{1}{2}a^2 - a \end{pmatrix}$$

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

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

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

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

$$a_9 = \begin{pmatrix} a \\ \frac{1}{2}a^3 - \frac{1}{2}a^2 + a - 2 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -\frac{1}{2}a^3 - \frac{1}{2}a^2 - a \\ -a^3 - 2a + 3 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} a \\ \frac{1}{2}a^3 - \frac{1}{2}a^2 + 2a - 2 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -\frac{1}{2}a^3 - \frac{1}{2}a^2 \\ -\frac{1}{2}a^3 - \frac{1}{2}a^2 + 1 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -\frac{1}{2}a^3 - \frac{1}{2}a^2 \\ -\frac{1}{2}a^3 - \frac{1}{2}a^2 + 1 \end{pmatrix}$$

(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
$u = -1.00000I$ $a = -0.41880 - 1.69390I$ $b = 0.27510 - 2.11269I$	1.64493	0
$u = 1.00000I$ $a = -0.41880 + 1.69390I$ $b = 0.27510 + 2.11269I$	1.64493	0
$u = 1.00000I$ $a = 0.418797 - 0.693897I$ $b = -1.27510 - 1.11269I$	1.64493	0
$u = -1.00000I$ $a = 0.418797 + 0.693897I$ $b = -1.27510 + 1.11269I$	1.64493	0

II.

$$I_2^u = \langle u^{12} - 6u^{11} + \dots - 3u + 1, -u^{11} + 5u^{10} + \dots + a - 2, -u^{11} + 6u^{10} + \dots + b - 3u \rangle$$

(i) Arc colorings

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

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

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

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

$$a_{10} = \begin{pmatrix} u^{11} - 5u^{10} + \dots - u + 2 \\ u^{11} - 6u^{10} + \dots - 6u^2 + 3u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u^{11} + 6u^{10} + \dots - 9u + 2 \\ u^2 - u + 1 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u^{11} - 6u^{10} + \dots + 7u - 1 \\ -u^4 + 2u^3 - 3u^2 + 3u - 1 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} u^{11} - 5u^{10} + \dots - u + 2 \\ u^{11} - 6u^{10} + \dots + 5u - 1 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} u^{11} - 7u^{10} + \dots + 13u - 3 \\ -u^{11} + 5u^{10} + \dots - u - 1 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} u^{11} - 4u^{10} + \dots - 2u + 2 \\ 2u^{11} - 11u^{10} + \dots + 6u - 1 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} u^{11} - 6u^{10} + \dots - 15u^2 + 6u \\ -u^7 + 3u^6 - 5u^5 + 5u^4 - u^3 - 2u^2 + 2u - 1 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} u^{11} - 6u^{10} + \dots - 15u^2 + 6u \\ -u^7 + 3u^6 - 5u^5 + 5u^4 - u^3 - 2u^2 + 2u - 1 \end{pmatrix}$$

(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
$u = -0.224527 - 0.491967I$	$-7.67039 - 6.40068I$	$-6.43797 + 4.87755I$
$a = -1.80164 - 0.59128I$		
$b = -0.362227 + 1.303827I$		
$u = -0.224527 + 0.491967I$	$-7.67039 + 6.40068I$	$-6.43797 - 4.87755I$
$a = -1.80164 + 0.59128I$		
$b = -0.362227 - 1.303827I$		
$u = 0.160845 - 0.502812I$	$-0.92209 - 2.24636I$	$-7.11132 + 8.83230I$
$a = 2.14213 - 0.64819I$		
$b = 0.609630 - 0.981964I$		
$u = 0.160845 + 0.502812I$	$-0.92209 + 2.24636I$	$-7.11132 - 8.83230I$
$a = 2.14213 + 0.64819I$		
$b = 0.609630 + 0.981964I$		
$u = 0.38777 - 1.48567I$	$-2.15077 + 6.80393I$	$-5.48461 - 6.50411I$
$a = 0.293742 - 0.611093I$		
$b = 0.51430 - 1.59184I$		
$u = 0.38777 + 1.48567I$	$-2.15077 - 6.80393I$	$-5.48461 + 6.50411I$
$a = 0.293742 + 0.611093I$		
$b = 0.51430 + 1.59184I$		
$u = 0.454285 - 1.279883I$	$2.68926 + 5.20905I$	$1.24389 - 5.17860I$
$a = -0.278924 + 0.875366I$		
$b = -0.42362 + 1.68359I$		
$u = 0.454285 + 1.279883I$	$2.68926 - 5.20905I$	$1.24389 + 5.17860I$
$a = -0.278924 - 0.875366I$		
$b = -0.42362 - 1.68359I$		
$u = 0.803624 - 0.881445I$	$-4.98090 + 3.00358I$	$-6.27510 + 2.27848I$
$a = -0.856239 - 0.666314I$		
$b = -0.443728 - 1.081148I$		
$u = 0.803624 + 0.881445I$	$-4.98090 - 3.00358I$	$-6.27510 - 2.27848I$
$a = -0.856239 + 0.666314I$		
$b = -0.443728 + 1.081148I$		

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.25207$ $a = 0.349598$ $b = -0.110338$	-1.97860	21.2943
$u = 1.58393$ $a = -0.347728$ $b = 0.321617$	-8.14019	6.83591

$$\text{III. } I_3^u = \langle 9a^{48} - 9a^{47} + \dots - 2a + 2, 1.22 \times 10^{111}u - 1.27 \times 10^{112}a^{47} + \dots + 1.82 \times 10^{112}a - 2.04 \times 10^{112}, 6.10 \times 10^{110}b + 4.72 \times 10^{112}a^{47} + \dots + 1.85 \times 10^{112}a - 6.43 \times 10^{110} \rangle$$

(i) Arc colorings

$$\begin{aligned} a_2 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_6 &= \begin{pmatrix} 0 \\ 10.4439a^{47} + 13.8459a^{46} + \dots - 14.9207a + 16.7126 \end{pmatrix} \\ a_5 &= \begin{pmatrix} 10.4439a^{47} + 13.8459a^{46} + \dots - 14.9207a + 16.7126 \\ 10.4439a^{47} + 13.8459a^{46} + \dots - 14.9207a + 16.7126 \end{pmatrix} \\ a_3 &= \begin{pmatrix} 2.79181a^{47} + 66.4590a^{46} + \dots - 48.9804a + 34.7184 \\ 2.79181a^{47} + 66.4590a^{46} + \dots - 48.9804a + 33.7184 \end{pmatrix} \\ a_{10} &= \begin{pmatrix} a \\ -77.4723a^{47} + 105.008a^{46} + \dots - 30.3171a + 1.05556 \end{pmatrix} \\ a_4 &= \begin{pmatrix} 6.81210a^{47} + 31.2780a^{46} + \dots - 27.0806a + 18.3678 \\ -19.7247a^{47} - 11.4825a^{46} + \dots + 28.7076a - 27.6460 \end{pmatrix} \\ a_7 &= \begin{pmatrix} 115.871a^{47} - 184.686a^{46} + \dots + 88.4241a - 18.2027 \\ 75.7844a^{47} - 53.6190a^{46} + \dots - 0.583966a + 21.3311 \end{pmatrix} \\ a_9 &= \begin{pmatrix} a \\ -8.22149a^{47} + 19.6573a^{46} + \dots + 4.02164a + 0.435161 \end{pmatrix} \\ a_1 &= \begin{pmatrix} 11.4358a^{47} - 6.54243a^{46} + \dots - 1.39184a + 2.82700 \\ -45.4139a^{47} + 37.4469a^{46} + \dots - 1.97136a - 17.7667 \end{pmatrix} \\ a_8 &= \begin{pmatrix} 146.406a^{47} - 203.061a^{46} + \dots + 77.2759a - 6.69116 \\ 137.238a^{47} - 147.270a^{46} + \dots + 47.8737a + 11.8535 \end{pmatrix} \\ a_{11} &= \begin{pmatrix} -161.626a^{47} + 260.534a^{46} + \dots - 130.560a + 28.4287 \\ -146.331a^{47} + 124.296a^{46} + \dots - 21.9320a - 36.1620 \end{pmatrix} \\ a_{11} &= \begin{pmatrix} -161.626a^{47} + 260.534a^{46} + \dots - 130.560a + 28.4287 \\ -146.331a^{47} + 124.296a^{46} + \dots - 21.9320a - 36.1620 \end{pmatrix} \end{aligned}$$

(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
$u = -0.263524 - 0.887339I$		
$a = -1.86884 - 0.29175I$	$-0.45153 - 3.90914I$	$-4.05947 + 8.41437I$
$b = -0.879566 + 0.016951I$		
$u = -0.263524 + 0.887339I$		
$a = -1.86884 + 0.29175I$	$-0.45153 + 3.90914I$	$-4.05947 - 8.41437I$
$b = -0.879566 - 0.016951I$		
$u = -0.387072 - 0.629729I$		
$a = -1.76415 - 0.26748I$	$-8.06651 + 4.88076I$	$-7.61294 - 0.00229I$
$b = 0.284144 + 0.011865I$		
$u = -0.387072 + 0.629729I$		
$a = -1.76415 + 0.26748I$	$-8.06651 - 4.88076I$	$-7.61294 + 0.00229I$
$b = 0.284144 - 0.011865I$		
$u = 0.887982 - 0.619939I$		
$a = -0.546828 - 0.591593I$	$-6.92221 + 3.07969I$	$-9.61105 - 4.95105I$
$b = 0.595175 - 1.029694I$		
$u = 0.887982 + 0.619939I$		
$a = -0.546828 + 0.591593I$	$-6.92221 - 3.07969I$	$-9.61105 + 4.95105I$
$b = 0.595175 + 1.029694I$		
$u = 0.34545 + 1.40335I$		
$a = -0.519054 - 0.983590I$	$-0.65429 - 7.12209I$	$0.24406 + 7.53717I$
$b = -1.02941 - 1.69817I$		
$u = 0.34545 - 1.40335I$		
$a = -0.519054 + 0.983590I$	$-0.65429 + 7.12209I$	$0.24406 - 7.53717I$
$b = -1.02941 + 1.69817I$		
$u = -0.263524 - 0.887339I$		
$a = -0.486571 - 0.819066I$	$-0.45153 - 3.90914I$	$-4.05947 + 8.41437I$
$b = -0.96598 - 2.09565I$		
$u = -0.263524 + 0.887339I$		
$a = -0.486571 + 0.819066I$	$-0.45153 + 3.90914I$	$-4.05947 - 8.41437I$
$b = -0.96598 + 2.09565I$		

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.66247 + 1.36339I$ $a = -0.345640 - 0.696381I$ $b = -0.658101 - 0.845108I$	$-4.26677 - 6.65894I$	$-7.66647 + 7.55605I$
$u = 0.66247 - 1.36339I$ $a = -0.345640 + 0.696381I$ $b = -0.658101 + 0.845108I$	$-4.26677 + 6.65894I$	$-7.66647 - 7.55605I$
$u = -0.387072 - 0.629729I$ $a = -0.29944 - 1.53355I$ $b = -1.33590 - 1.44688I$	$-8.06651 + 4.88076I$	$-7.61294 - 0.00229I$
$u = -0.387072 + 0.629729I$ $a = -0.29944 + 1.53355I$ $b = -1.33590 + 1.44688I$	$-8.06651 - 4.88076I$	$-7.61294 + 0.00229I$
$u = 1.24600$ $a = -0.189196 - 0.350223I$ $b = 0.529467 + 0.107348I$	-8.40649	-13.8585
$u = 1.24600$ $a = -0.189196 + 0.350223I$ $b = 0.529467 - 0.107348I$	-8.40649	-13.8585
$u = 0.334204 + 1.242177I$ $a = -0.181840 - 0.625293I$ $b = 0.66970 - 1.59883I$	$4.15748 - 4.71846I$	$5.79042 + 6.26335I$
$u = 0.334204 - 1.242177I$ $a = -0.181840 + 0.625293I$ $b = 0.66970 + 1.59883I$	$4.15748 + 4.71846I$	$5.79042 - 6.26335I$
$u = 0.510133 - 0.304616I$ $a = -0.159956 - 1.155296I$ $b = -0.399327 + 0.420233I$	$-0.17657 + 1.63085I$	$-4.99918 - 5.43978I$
$u = 0.510133 + 0.304616I$ $a = -0.159956 + 1.155296I$ $b = -0.399327 - 0.420233I$	$-0.17657 - 1.63085I$	$-4.99918 + 5.43978I$

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.887982 + 0.619939I$ $a = -0.142573 - 0.651331I$ $b = 0.192842 + 0.233907I$	$-6.92221 - 3.07969I$	$-9.61105 + 4.95105I$
$u = 0.887982 - 0.619939I$ $a = -0.142573 + 0.651331I$ $b = 0.192842 - 0.233907I$	$-6.92221 + 3.07969I$	$-9.61105 - 4.95105I$
$u = 0.54684 + 1.32589I$ $a = -0.073360 - 0.837723I$ $b = -0.48207 - 1.91865I$	$1.92307 - 5.70686I$	$-7.16158 + 11.30466I$
$u = 0.54684 - 1.32589I$ $a = -0.073360 + 0.837723I$ $b = -0.48207 + 1.91865I$	$1.92307 + 5.70686I$	$-7.16158 - 11.30466I$
$u = 0.66247 - 1.36339I$ $a = -0.029253 - 0.785736I$ $b = 0.65736 - 2.10113I$	$-4.26677 + 6.65894I$	$-7.66647 - 7.55605I$
$u = 0.66247 + 1.36339I$ $a = -0.029253 + 0.785736I$ $b = 0.65736 + 2.10113I$	$-4.26677 - 6.65894I$	$-7.66647 + 7.55605I$
$u = 0.277461 + 1.036230I$ $a = 0.07552 - 1.77654I$ $b = -0.45845 - 2.26217I$	$1.42987 - 1.40919I$	$-2.00295 + 5.17297I$
$u = 0.277461 - 1.036230I$ $a = 0.07552 + 1.77654I$ $b = -0.45845 + 2.26217I$	$1.42987 + 1.40919I$	$-2.00295 - 5.17297I$
$u = 0.34545 - 1.40335I$ $a = 0.110194 - 0.657429I$ $b = -0.35971 - 2.17763I$	$-0.65429 + 7.12209I$	$0.24406 - 7.53717I$
$u = 0.34545 + 1.40335I$ $a = 0.110194 + 0.657429I$ $b = -0.35971 + 2.17763I$	$-0.65429 - 7.12209I$	$0.24406 + 7.53717I$

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.06754$ $a = 0.119785 - 0.211933I$ $b = -0.264386 + 0.015281I$	-2.16765	-17.3624
$u = 1.06754$ $a = 0.119785 + 0.211933I$ $b = -0.264386 - 0.015281I$	-2.16765	-17.3624
$u = -0.333614 + 0.958581I$ $a = 0.281424 - 0.826584I$ $b = 1.27609 - 2.26621I$	$-7.10793 + 8.02681I$	$-5.10804 - 8.04729I$
$u = -0.333614 - 0.958581I$ $a = 0.281424 + 0.826584I$ $b = 1.27609 + 2.26621I$	$-7.10793 - 8.02681I$	$-5.10804 + 8.04729I$
$u = 0.277461 - 1.036230I$ $a = 0.285710 - 0.547276I$ $b = -1.26237 - 0.79589I$	$1.42987 + 1.40919I$	$-2.00295 - 5.17297I$
$u = 0.277461 + 1.036230I$ $a = 0.285710 + 0.547276I$ $b = -1.26237 + 0.79589I$	$1.42987 - 1.40919I$	$-2.00295 + 5.17297I$
$u = 0.54684 - 1.32589I$ $a = 0.294249 - 0.754696I$ $b = 0.453062 - 1.229740I$	$1.92307 + 5.70686I$	$-7.16158 - 11.30466I$
$u = 0.54684 + 1.32589I$ $a = 0.294249 + 0.754696I$ $b = 0.453062 + 1.229740I$	$1.92307 - 5.70686I$	$-7.16158 + 11.30466I$
$u = 0.334204 - 1.242177I$ $a = 0.349024 - 1.260520I$ $b = 0.83020 - 1.94926I$	$4.15748 + 4.71846I$	$5.79042 - 6.26335I$
$u = 0.334204 + 1.242177I$ $a = 0.349024 + 1.260520I$ $b = 0.83020 + 1.94926I$	$4.15748 - 4.71846I$	$5.79042 + 6.26335I$

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.237103 + 0.737994I$		
$a = 0.78897 - 1.24768I$	$-0.89648 - 1.35600I$	$-6.20233 - 1.19503I$
$b = 1.02029 - 1.57644I$		
$u = -0.237103 - 0.737994I$		
$a = 0.78897 + 1.24768I$	$-0.89648 + 1.35600I$	$-6.20233 + 1.19503I$
$b = 1.02029 + 1.57644I$		
$u = 0.510133 + 0.304616I$		
$a = 1.373165 - 0.277947I$	$-0.17657 - 1.63085I$	$-4.99918 + 5.43978I$
$b = 0.117208 - 0.920853I$		
$u = 0.510133 - 0.304616I$		
$a = 1.373165 + 0.277947I$	$-0.17657 + 1.63085I$	$-4.99918 - 5.43978I$
$b = 0.117208 + 0.920853I$		
$u = -0.237103 + 0.737994I$		
$a = 1.60517 - 0.24700I$	$-0.89648 - 1.35600I$	$-6.20233 - 1.19503I$
$b = 0.136720 - 0.436976I$		
$u = -0.237103 - 0.737994I$		
$a = 1.60517 + 0.24700I$	$-0.89648 + 1.35600I$	$-6.20233 + 1.19503I$
$b = 0.136720 + 0.436976I$		
$u = -0.333614 + 0.958581I$		
$a = 1.82350 - 0.09201I$	$-7.10793 + 8.02681I$	$-5.10804 - 8.04729I$
$b = 0.833015 + 0.546460I$		
$u = -0.333614 - 0.958581I$		
$a = 1.82350 + 0.09201I$	$-7.10793 - 8.02681I$	$-5.10804 + 8.04729I$
$b = 0.833015 - 0.546460I$		

$$\text{IV. } I_4^u = \langle u^{35} + 9u^{34} + \dots + 129u + 8, 5.73 \times 10^{21}u^{34} + 5.79 \times 10^{22}u^{33} + \dots + 1.46 \times 10^{23}b + 3.05 \times 10^{23}, 1.59 \times 10^{23}u^{34} + 1.58 \times 10^{24}u^{33} + \dots + 1.17 \times 10^{24}a + 1.93 \times 10^{25} \rangle$$

(i) Arc colorings

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

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

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

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

$$a_{10} = \begin{pmatrix} -0.135989u^{34} - 1.34853u^{33} + \dots - 110.856u - 16.5466 \\ -0.0392310u^{34} - 0.396184u^{33} + \dots - 18.1615u - 2.08497 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 0.226399u^{34} + 1.78191u^{33} + \dots + 64.9143u + 11.3787 \\ 0.0718538u^{34} + 0.380306u^{33} + \dots - 12.3443u - 0.234219 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -0.0185758u^{34} - 0.224592u^{33} + \dots + 37.7643u + 7.33120 \\ -0.107422u^{34} - 0.980585u^{33} + \dots - 13.6650u - 0.522268 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -0.135989u^{34} - 1.34853u^{33} + \dots - 110.856u - 16.5466 \\ 0.124632u^{34} + 0.957827u^{33} + \dots - 0.995973u - 1.08791 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -0.0878378u^{34} - 0.551320u^{33} + \dots + 70.1500u + 13.5898 \\ -0.239219u^{34} - 2.22799u^{33} + \dots - 23.9209u - 0.702702 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -0.0148592u^{34} - 0.341708u^{33} + \dots - 101.394u - 15.1034 \\ 0.327289u^{34} + 2.78204u^{33} + \dots + 10.4461u - 0.418777 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 0.0716655u^{34} + 0.719375u^{33} + \dots - 13.6441u - 3.60651 \\ -0.0372386u^{34} - 0.0561449u^{33} + \dots + 21.9167u + 0.926166 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 0.0716655u^{34} + 0.719375u^{33} + \dots - 13.6441u - 3.60651 \\ -0.0372386u^{34} - 0.0561449u^{33} + \dots + 21.9167u + 0.926166 \end{pmatrix}$$

(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
$u = -1.204478 - 0.248072I$		
$a = 0.887964 + 0.392532I$	$-7.58044 + 10.41688I$	$-6.58450 - 6.84896I$
$b = -0.026853 - 0.382884I$		
$u = -1.204478 + 0.248072I$		
$a = 0.887964 - 0.392532I$	$-7.58044 - 10.41688I$	$-6.58450 + 6.84896I$
$b = -0.026853 + 0.382884I$		
$u = -1.032064 - 0.216151I$		
$a = -1.036124 - 0.458384I$	$-0.31706 + 7.01027I$	$-3.82014 - 7.79890I$
$b = -0.119556 + 0.232074I$		
$u = -1.032064 + 0.216151I$		
$a = -1.036124 + 0.458384I$	$-0.31706 - 7.01027I$	$-3.82014 + 7.79890I$
$b = -0.119556 - 0.232074I$		
$u = -0.746671 - 0.829900I$		
$a = -1.286683 + 0.556421I$	$-5.09357 - 3.39425I$	$-14.2242 + 15.5417I$
$b = -0.901751 + 1.015274I$		
$u = -0.746671 + 0.829900I$		
$a = -1.286683 - 0.556421I$	$-5.09357 + 3.39425I$	$-14.2242 - 15.5417I$
$b = -0.901751 - 1.015274I$		
$u = -0.719504 - 0.276631I$		
$a = 1.42702 + 0.47857I$	$0.64524 + 2.18197I$	$-1.66363 - 5.31437I$
$b = 0.455319 - 0.040096I$		
$u = -0.719504 + 0.276631I$		
$a = 1.42702 - 0.47857I$	$0.64524 - 2.18197I$	$-1.66363 + 5.31437I$
$b = 0.455319 + 0.040096I$		
$u = -0.64890 - 1.31702I$		
$a = -0.143192 - 1.130503I$	$-4.1620 - 16.9207I$	$-4.65236 + 8.62196I$
$b = -0.72438 - 2.16230I$		
$u = -0.64890 + 1.31702I$		
$a = -0.143192 + 1.130503I$	$-4.1620 + 16.9207I$	$-4.65236 - 8.62196I$
$b = -0.72438 + 2.16230I$		

Solution to I_4^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.648498 - 0.961930I$ $a = -0.31867 + 1.39500I$ $b = 0.03103 + 1.69984I$	$-4.64663 - 2.02674I$	$-10.39702 - 3.31188I$
$u = -0.648498 + 0.961930I$ $a = -0.31867 - 1.39500I$ $b = 0.03103 - 1.69984I$	$-4.64663 + 2.02674I$	$-10.39702 + 3.31188I$
$u = -0.595757 - 1.264358I$ $a = 0.174530 + 1.201298I$ $b = 0.61192 + 2.16745I$	$2.94252 - 12.83480I$	$-1.59518 + 9.50250I$
$u = -0.595757 + 1.264358I$ $a = 0.174530 - 1.201298I$ $b = 0.61192 - 2.16745I$	$2.94252 + 12.83480I$	$-1.59518 - 9.50250I$
$u = -0.548826 - 1.162058I$ $a = -0.195398 - 1.363500I$ $b = -0.46697 - 2.15669I$	$3.22979 - 7.07568I$	$-1.38313 + 9.02703I$
$u = -0.548826 + 1.162058I$ $a = -0.195398 + 1.363500I$ $b = -0.46697 + 2.15669I$	$3.22979 + 7.07568I$	$-1.38313 - 9.02703I$
$u = -0.405669 - 1.141420I$ $a = 0.196196 - 0.886051I$ $b = 0.49372 - 1.32576I$	$4.39987 - 1.11837I$	$2.66422 + 2.51524I$
$u = -0.405669 + 1.141420I$ $a = 0.196196 + 0.886051I$ $b = 0.49372 + 1.32576I$	$4.39987 + 1.11837I$	$2.66422 - 2.51524I$
$u = -0.271698 - 1.365605I$ $a = -0.044130 + 0.649233I$ $b = -0.495853 + 1.311691I$	$5.18517 + 2.44630I$	$3.60455 - 4.73123I$
$u = -0.271698 + 1.365605I$ $a = -0.044130 - 0.649233I$ $b = -0.495853 - 1.311691I$	$5.18517 - 2.44630I$	$3.60455 + 4.73123I$

Solution to I_4^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.15479 - 1.53945I$		
$a = -0.009969 - 0.509978I$	$-0.87578 + 5.04274I$	$-1.43283 - 3.64618I$
$b = 0.517106 - 1.285916I$		
$u = -0.15479 + 1.53945I$		
$a = -0.009969 + 0.509978I$	$-0.87578 - 5.04274I$	$-1.43283 + 3.64618I$
$b = 0.517106 + 1.285916I$		
$u = -0.100849$		
$a = -8.56933$	-3.33456	-1.41011
$b = -0.777057$		
$u = -0.030627 - 1.114570I$		
$a = 0.609593 + 0.947255I$	$-0.301669 - 0.553139I$	$-3.58187 + 1.60443I$
$b = -0.21574 + 1.84268I$		
$u = -0.030627 + 1.114570I$		
$a = 0.609593 - 0.947255I$	$-0.301669 + 0.553139I$	$-3.58187 - 1.60443I$
$b = -0.21574 - 1.84268I$		
$u = 0.029467 - 1.005662I$		
$a = -0.504374 - 1.097913I$	$3.33325 + 0.06783I$	$5.95235 + 0.12495I$
$b = 0.67440 - 1.61420I$		
$u = 0.029467 + 1.005662I$		
$a = -0.504374 + 1.097913I$	$3.33325 - 0.06783I$	$5.95235 - 0.12495I$
$b = 0.67440 + 1.61420I$		
$u = 0.160155 - 0.940171I$		
$a = 0.678022 + 1.180067I$	$-1.89744 + 0.70933I$	$-2.29610 + 0.18489I$
$b = -0.99150 + 1.66546I$		
$u = 0.160155 + 0.940171I$		
$a = 0.678022 - 1.180067I$	$-1.89744 - 0.70933I$	$-2.29610 - 0.18489I$
$b = -0.99150 - 1.66546I$		
$u = 0.308052 - 0.545459I$		
$a = 0.762564 - 0.126969I$	$-0.241930 + 1.296498I$	$-3.54219 - 4.67694I$
$b = 0.031534 + 0.685600I$		

Solution to I_4^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.308052 + 0.545459I$		
$a = 0.762564 + 0.126969I$	$-0.241930 - 1.296498I$	$-3.54219 + 4.67694I$
$b = 0.031534 - 0.685600I$		
$u = 0.795787 - 0.881934I$		
$a = -0.329420 - 0.075312I$	$-6.54898 + 2.97371I$	$-10.02830 - 2.31900I$
$b = 0.386670 - 0.703873I$		
$u = 0.795787 + 0.881934I$		
$a = -0.329420 + 0.075312I$	$-6.54898 - 2.97371I$	$-10.02830 + 2.31900I$
$b = 0.386670 + 0.703873I$		
$u = 1.11586$		
$a = 0.111819$	-2.17258	-20.5005
$b = -0.264005$		
$u = 1.41303$		
$a = -0.153347$	-8.46698	-18.1287
$b = 0.522862$		

V. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1, c_9	$(u^4 + 2u^3 - u^2 - 2u + 2)(u^{12} + 2u^{11} + \dots - u - 1)$ $(u^{35} + 2u^{34} + \dots - u - 1)(u^{48} + u^{47} + \dots + 16u^2 + 2)$
c_2	$(u^2 + 1)^2(u^{12} - 6u^{11} + \dots - 3u + 1)$ $(3 + 15u + 49u^2 + 129u^3 + 295u^4 + 583u^5 + 1044u^6 + 1689u^7 + 2504u^8 + 3409u^9 + 4273u^{10}$ $(u^{35} - 9u^{34} + \dots + 129u - 8)$
c_3	$(u^2 + 1)^2(u^{12} + 2u^{11} + \dots + 2u + 1)(u^{35} + 2u^{34} + \dots - 7u + 2)$ $(u^{48} + 7u^{47} + \dots + 28u + 8)$
c_4	$(u^4 + 3u^2 + 2u + 2)$ $(u^{12} - u^{10} + u^9 + 2u^8 - 4u^7 + 2u^6 - u^5 + 3u^4 - u^3 - u^2 - u - 1)$ $(u^{35} + 5u^{33} + \dots - 10u - 4)(u^{48} + u^{47} + \dots - 48u + 32)$
c_5	$(u^2 + 1)^2(u^{12} + 6u^{11} + \dots + 3u + 1)$ $(3 + 15u + 49u^2 + 129u^3 + 295u^4 + 583u^5 + 1044u^6 + 1689u^7 + 2504u^8 + 3409u^9 + 4273u^{10}$ $(u^{35} - 9u^{34} + \dots + 129u - 8)$
c_6	$(u^2 + 1)^2(u^{12} + 2u^{11} + \dots + 2u + 1)(u^{35} + 2u^{34} + \dots - 7u + 2)$ $(u^{48} + 7u^{47} + \dots + 28u + 8)$
c_7	$(u - 1)^4(u^{12} + 3u^{11} + \dots + u - 1)$ $(-1 + 3u + 3u^2 - 5u^3 - 27u^4 - 7u^5 + 72u^6 + 159u^7 + 4u^8 - 339u^9 - 305u^{10} + 259u^{11} + 556u^{12}$ $(u^{35} + 10u^{34} + \dots - 7u - 2)$
c_8	$(u^4 + 3u^2 + 2u + 2)$ $(u^{12} - u^{10} + u^9 + 2u^8 - 4u^7 + 2u^6 - u^5 + 3u^4 - u^3 - u^2 - u - 1)$ $(u^{35} + 5u^{33} + \dots - 10u - 4)(u^{48} + u^{47} + \dots - 48u + 32)$
c_{10}, c_{11}	$(u + 1)^4(u^{12} - 3u^{11} + \dots - u - 1)$ $(-1 + 3u + 3u^2 - 5u^3 - 27u^4 - 7u^5 + 72u^6 + 159u^7 + 4u^8 - 339u^9 - 305u^{10} + 259u^{11} + 556u^{12}$ $(u^{35} + 10u^{34} + \dots - 7u - 2)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_9	$(y^4 - 6y^3 + \dots - 8y + 4)(y^{12} - 2y^{10} + \dots - 7y + 1)$ $(y^{35} - 28y^{34} + \dots + 97y - 1)(y^{48} + y^{47} + \dots + 64y + 4)$
c_2, c_5	$(y + 1)^4(y^{12} + 4y^{11} + \dots + 11y + 1)$ $(9 + 69y + 301y^2 + 1043y^3 + 3277y^4 + 9069y^5 + 2.05 \times 10^4 y^6 + 3.62 \times 10^4 y^7 + 4.78 \times 10^4 y^8)$ $(y^{35} + 17y^{34} + \dots + 5825y - 64)$
c_3	$(y + 1)^4(y^{12} - 12y^{11} + \dots - 10y^2 + 1)(y^{35} + 4y^{34} + \dots - 35y - 4)$ $(y^{48} - 21y^{47} + \dots + 176y + 64)$
c_4	$(y^4 + 6y^3 + \dots + 8y + 4)(y^{12} - 2y^{11} + \dots + y + 1)$ $(y^{35} + 10y^{34} + \dots - 68y - 16)(y^{48} + 9y^{47} + \dots + 20736y + 1024)$
c_6	$(y + 1)^4(y^{12} - 12y^{11} + \dots - 10y^2 + 1)(y^{35} + 4y^{34} + \dots - 35y - 4)$ $(y^{48} - 21y^{47} + \dots + 176y + 64)$
c_7, c_{11}	$(y - 1)^4(y^{12} - 15y^{11} + \dots + y + 1)(y^{35} - 38y^{34} + \dots - 63y - 4)$ $(y^{48} - 50y^{47} + \dots - 30y + 1)$
c_8	$(y^4 + 6y^3 + \dots + 8y + 4)(y^{12} - 2y^{11} + \dots + y + 1)$ $(y^{35} + 10y^{34} + \dots - 68y - 16)(y^{48} + 9y^{47} + \dots + 20736y + 1024)$
c_{10}	$(y - 1)^4(y^{12} - 15y^{11} + \dots + y + 1)(y^{35} - 38y^{34} + \dots - 63y - 4)$ $(y^{48} - 50y^{47} + \dots - 30y + 1)$