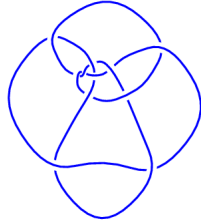
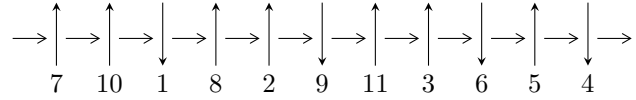


11a<sub>297</sub> (K11a<sub>297</sub>)

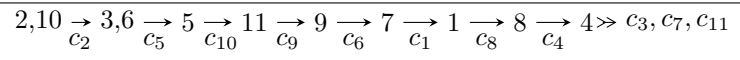


1

**Arc Sequences**



**Solving Sequence**



**Representation Ideals**

$$I = \bigcap_{i=1}^9 I_i^u \bigcap I_1^v$$

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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>”

$$\begin{aligned}
I_1^u &= \langle u^2 + u + 1, a - u, b + u \rangle \\
I_2^u &= \langle u^2 + 3u + 3, b + u + 1, 3a - 2u - 3 \rangle \\
I_3^u &= \langle u^{12} + u^{11} + 5u^9 + 12u^8 + 5u^7 - 5u^6 - 9u^5 + 8u^3 + 4u^2 - 4u + 1, \\
&\quad 55744u^{11} + 91746u^{10} + \cdots + 263203b + 118946, \\
&\quad - 495118u^{11} - 677148u^{10} + \cdots + 263203a + 790117 \rangle \\
I_4^u &= \langle u^{15} - 3u^{13} + 11u^{11} - u^{10} - 19u^9 + 9u^8 + 24u^7 - 12u^6 - 15u^5 + 12u^4 + 10u^3 + u + 1, b - u, \\
&\quad - 265u^{14} + 73u^{13} + \cdots + 206a - 114 \rangle \\
I_5^u &= \langle u^{16} + u^{15} + \cdots + u + 1, b + u, 1534506u^{15} + 1471220u^{14} + \cdots + 1413817a - 3016062 \rangle \\
I_6^u &= \langle u^{22} + 2u^{21} + \cdots - u + 1, b - u, \\
&\quad 2571269881u^{21} - 785869826u^{20} + \cdots + 798992461a - 25388018605 \rangle \\
I_7^u &= \langle u^{48} + 3u^{47} + \cdots - 14u + 7, \\
&\quad - 1.20392 \times 10^{112}u^{47} - 3.68095 \times 10^{112}u^{46} + \cdots + 8.03592 \times 10^{112}a - 4.03353 \times 10^{112}, \\
&\quad - 2.02538 \times 10^{116}u^{47} - 6.03987 \times 10^{116}u^{46} + \cdots + 2.04295 \times 10^{117}b + 2.40362 \times 10^{117} \rangle \\
I_8^u &= \langle u^2 - u + 1, b, a + 1 \rangle \\
I_9^u &= \langle u^2 - u + 1, a - u, b + u + 1 \rangle \\
I_1^v &= \langle v - 1, b^2 - b + 1, a \rangle
\end{aligned}$$

There are 10 irreducible components with 123 representations.

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

(i) Arc colorings

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

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

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

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

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

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

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

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

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

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

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

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

(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
$u = -0.500000 - 0.866025I$	4.05977I	- 6.92820I
$a = -0.500000 - 0.866025I$		
$b = 0.500000 + 0.866025I$		
$u = -0.500000 + 0.866025I$	- 4.05977I	6.92820I
$a = -0.500000 + 0.866025I$		
$b = 0.500000 - 0.866025I$		

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

(i) Arc colorings

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

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

$$a_3 = \begin{pmatrix} -\frac{1}{3}u \\ u + 2 \end{pmatrix}$$

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

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

$$a_{11} = \begin{pmatrix} -\frac{4}{3}u - 2 \\ u + 2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} \frac{2}{3}u + 1 \\ -2u - 4 \end{pmatrix}$$

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

$$a_1 = \begin{pmatrix} \frac{1}{3}u + 2 \\ u + 1 \end{pmatrix}$$

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

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

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

(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
$u = -1.50000 - 0.86603I$		
$a = -0.577350I$	$6.08965I$	$-10.3923I$
$b = 0.500000 + 0.866025I$		
$u = -1.50000 + 0.86603I$		
$a = 0.577350I$	$-6.08965I$	$10.3923I$
$b = 0.500000 - 0.866025I$		

$$\text{III. } I_3^u = \langle u^{12} + u^{11} + \dots - 4u + 1, 55744u^{11} + 91746u^{10} + \dots + 263203b + 118946, -4.95 \times 10^5 u^{11} - 6.77 \times 10^5 u^{10} + \dots + 2.63 \times 10^5 a + 7.90 \times 10^5 \rangle$$

(i) Arc colorings

$$\begin{aligned} a_2 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_{10} &= \begin{pmatrix} 1.88113u^{11} + 2.57272u^{10} + \dots + 12.9732u - 3.00193 \\ -0.211791u^{11} - 0.348575u^{10} + \dots - 3.04283u - 0.451917 \end{pmatrix} \\ a_3 &= \begin{pmatrix} 2.90767u^{11} + 4.03515u^{10} + \dots + 20.0578u - 6.11208 \\ -0.678643u^{11} - 1.47117u^{10} + \dots - 6.71088u + 0.757966 \end{pmatrix} \\ a_6 &= \begin{pmatrix} 0 \\ u \end{pmatrix} \\ a_5 &= \begin{pmatrix} -u \\ u \end{pmatrix} \\ a_{11} &= \begin{pmatrix} 1.93046u^{11} + 2.71714u^{10} + \dots + 13.5231u - 3.55674 \\ -0.261129u^{11} - 0.492996u^{10} + \dots - 3.59274u + 0.102894 \end{pmatrix} \\ a_9 &= \begin{pmatrix} 1.88113u^{11} + 2.57272u^{10} + \dots + 12.9732u - 3.00193 \\ -0.497935u^{11} - 0.617242u^{10} + \dots - 3.92809u + 0.239678 \end{pmatrix} \\ a_7 &= \begin{pmatrix} -0.793091u^{11} - 0.387108u^{10} + \dots - 1.15020u + 5.68285 \\ 0.895985u^{11} + 0.751131u^{10} + \dots + 3.10158u - 2.50169 \end{pmatrix} \\ a_1 &= \begin{pmatrix} 4.04843u^{11} + 5.23094u^{10} + \dots + 27.1521u - 12.6823 \\ -1.19171u^{11} - 2.26622u^{10} + \dots - 13.5173u + 3.94907 \end{pmatrix} \\ a_8 &= \begin{pmatrix} -1.57977u^{11} - 1.35178u^{10} + \dots - 5.31531u + 7.61332 \\ 1.12785u^{11} + 1.11165u^{10} + \dots + 4.04320u - 2.76282 \end{pmatrix} \\ a_4 &= \begin{pmatrix} 0.234500u^{11} - 0.743893u^{10} + \dots - 3.38618u - 8.24715 \\ -0.992466u^{11} - 0.692716u^{10} + \dots - 5.06788u + 4.56814 \end{pmatrix} \\ a_4 &= \begin{pmatrix} 0.234500u^{11} - 0.743893u^{10} + \dots - 3.38618u - 8.24715 \\ -0.992466u^{11} - 0.692716u^{10} + \dots - 5.06788u + 4.56814 \end{pmatrix} \end{aligned}$$

(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
$u = -1.37483 - 0.58456I$ $a = -0.209868 - 0.861531I$ $b = 0.291045 + 0.197103I$	$6.04826 + 3.62636I$	$11.01951 - 2.49479I$
$u = -1.37483 + 0.58456I$ $a = -0.209868 + 0.861531I$ $b = 0.291045 - 0.197103I$	$6.04826 - 3.62636I$	$11.01951 + 2.49479I$
$u = -0.961053 - 0.509737I$ $a = -0.388351 - 1.154135I$ $b = 1.16740 + 1.64205I$	$6.04826 + 7.68613I$	$11.0195 - 9.4230I$
$u = -0.961053 + 0.509737I$ $a = -0.388351 + 1.154135I$ $b = 1.16740 - 1.64205I$	$6.04826 - 7.68613I$	$11.0195 + 9.4230I$
$u = -0.365745 - 0.996574I$ $a = 0.184942 - 0.503925I$ $b = 0.743183 + 0.342830I$	$-2.22691 + 2.02988I$	$-2.03902 - 3.46410I$
$u = -0.365745 + 0.996574I$ $a = 0.184942 + 0.503925I$ $b = 0.743183 - 0.342830I$	$-2.22691 - 2.02988I$	$-2.03902 + 3.46410I$
$u = 0.291045 - 0.197103I$ $a = 1.57858 - 3.42215I$ $b = -1.37483 + 0.58456I$	$6.04826 - 3.62636I$	$11.01951 + 2.49479I$
$u = 0.291045 + 0.197103I$ $a = 1.57858 + 3.42215I$ $b = -1.37483 - 0.58456I$	$6.04826 + 3.62636I$	$11.01951 - 2.49479I$
$u = 0.743183 - 0.342830I$ $a = -0.632221 - 0.291643I$ $b = -0.365745 + 0.996574I$	$-2.22691 - 2.02988I$	$-2.03902 + 3.46410I$
$u = 0.743183 + 0.342830I$ $a = -0.632221 + 0.291643I$ $b = -0.365745 - 0.996574I$	$-2.22691 + 2.02988I$	$-2.03902 - 3.46410I$



Solution to $I_3^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.16740 - 1.64205I$	$6.04826 - 7.68613I$	$11.0195 + 9.4230I$
$a = 0.466921 - 0.462936I$		
$b = -0.961053 + 0.509737I$		
$u = 1.16740 + 1.64205I$	$6.04826 + 7.68613I$	$11.0195 - 9.4230I$
$a = 0.466921 + 0.462936I$		
$b = -0.961053 - 0.509737I$		

IV.

$$\Gamma_4^u = \langle u^{15} - 3u^{13} + \dots + u + 1, b - u, -265u^{14} + 73u^{13} + \dots + 206a - 114 \rangle$$

(i) Arc colorings

$$\begin{aligned} a_2 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_{10} &= \begin{pmatrix} 1.28641u^{14} - 0.354369u^{13} + \dots - 1.55825u + 0.553398 \\ u \end{pmatrix} \\ a_3 &= \begin{pmatrix} 0.354369u^{14} + 0.417476u^{13} + \dots + 0.733010u + 2.28641 \\ -u^2 \end{pmatrix} \\ a_6 &= \begin{pmatrix} 0 \\ u \end{pmatrix} \\ a_5 &= \begin{pmatrix} -u \\ u \end{pmatrix} \\ a_{11} &= \begin{pmatrix} 0.868932u^{14} + 0.475728u^{13} + \dots - 2.49029u + 0.907767 \\ 0.417476u^{14} - 0.830097u^{13} + \dots + 1.93204u - 0.354369 \end{pmatrix} \\ a_9 &= \begin{pmatrix} 1.28641u^{14} - 0.354369u^{13} + \dots - 1.55825u + 0.553398 \\ 0.417476u^{14} - 0.830097u^{13} + \dots + 1.93204u - 0.354369 \end{pmatrix} \\ a_7 &= \begin{pmatrix} -0.0485437u^{14} - 0.694175u^{13} + \dots - 1.92233u - 1.23786 \\ -0.305825u^{14} + 0.276699u^{13} + \dots + 1.18932u - 1.04854 \end{pmatrix} \\ a_1 &= \begin{pmatrix} -1.43689u^{14} + 1.25243u^{13} + \dots + 0.699029u + 0.359223 \\ -0.266990u^{14} - 0.0679612u^{13} + \dots - 1.07282u - 0.558252 \end{pmatrix} \\ a_8 &= \begin{pmatrix} -0.524272u^{14} + 0.902913u^{13} + \dots - 1.96117u - 0.368932 \\ 0.524272u^{14} - 0.902913u^{13} + \dots + 1.96117u - 0.631068 \end{pmatrix} \\ a_4 &= \begin{pmatrix} 0.902913u^{14} - 1.38835u^{13} + \dots - 0.844660u + 0.524272 \\ -0.902913u^{14} + 1.38835u^{13} + \dots - 0.155340u - 0.524272 \end{pmatrix} \\ a_4 &= \begin{pmatrix} 0.902913u^{14} - 1.38835u^{13} + \dots - 0.844660u + 0.524272 \\ -0.902913u^{14} + 1.38835u^{13} + \dots - 0.155340u - 0.524272 \end{pmatrix} \end{aligned}$$

(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
$u = -1.23126 - 1.12739I$ $a = 0.297247 + 0.833964I$ $b = -1.23126 - 1.12739I$	$2.8705 + 18.8513I$	$5.24479 - 9.91686I$
$u = -1.23126 + 1.12739I$ $a = 0.297247 - 0.833964I$ $b = -1.23126 + 1.12739I$	$2.8705 - 18.8513I$	$5.24479 + 9.91686I$
$u = -0.893182 - 0.343990I$ $a = 0.582415 + 1.019502I$ $b = -0.893182 - 0.343990I$	$4.49181 - 2.74770I$	$10.33723 + 3.64679I$
$u = -0.893182 + 0.343990I$ $a = 0.582415 - 1.019502I$ $b = -0.893182 + 0.343990I$	$4.49181 + 2.74770I$	$10.33723 - 3.64679I$
$u = -0.809054 - 0.248430I$ $a = -1.20725 - 0.79320I$ $b = -0.809054 - 0.248430I$	$2.30094 - 0.81192I$	$14.02805 - 1.67822I$
$u = -0.809054 + 0.248430I$ $a = -1.20725 + 0.79320I$ $b = -0.809054 + 0.248430I$	$2.30094 + 0.81192I$	$14.02805 + 1.67822I$
$u = -0.631819$ $a = -0.725435$ $b = -0.631819$	1.10086	9.32222
$u = 0.192367 - 0.393774I$ $a = -2.03992 - 0.30403I$ $b = 0.192367 - 0.393774I$	$0.10584 + 1.99596I$	$0.94373 - 4.15257I$
$u = 0.192367 + 0.393774I$ $a = -2.03992 + 0.30403I$ $b = 0.192367 + 0.393774I$	$0.10584 - 1.99596I$	$0.94373 + 4.15257I$
$u = 0.766772 - 0.909869I$ $a = 0.676096 + 0.581148I$ $b = 0.766772 - 0.909869I$	$-4.75552 - 7.02459I$	$-1.15185 + 6.50183I$

Solution to $I_4^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.766772 + 0.909869I$	$-4.75552 + 7.02459I$	$-1.15185 - 6.50183I$
$a = 0.676096 - 0.581148I$		
$b = 0.766772 + 0.909869I$		
$u = 1.128316 - 0.520392I$	$6.65899 - 10.66373I$	$9.06568 + 8.84200I$
$a = 0.028284 + 1.187495I$		
$b = 1.128316 - 0.520392I$		
$u = 1.128316 + 0.520392I$	$6.65899 + 10.66373I$	$9.06568 - 8.84200I$
$a = 0.028284 - 1.187495I$		
$b = 1.128316 + 0.520392I$		
$u = 1.16195 - 0.84340I$	$3.40393 - 1.50668I$	$7.87127 + 3.28737I$
$a = -0.474150 + 0.536466I$		
$b = 1.16195 - 0.84340I$		
$u = 1.16195 + 0.84340I$	$3.40393 + 1.50668I$	$7.87127 - 3.28737I$
$a = -0.474150 - 0.536466I$		
$b = 1.16195 + 0.84340I$		

$$\mathbf{V. } I_5^u = \langle u^{16} + u^{15} + \dots + u + 1, b + u, 1.53 \times 10^6 u^{15} + 1.47 \times 10^6 u^{14} + \dots + 1.41 \times 10^6 a - 3.02 \times 10^6 \rangle$$

(i) Arc colorings

$$\begin{aligned} a_2 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_{10} &= \begin{pmatrix} -1.08536u^{15} - 1.04060u^{14} + \dots + 2.59191u + 2.13328 \\ -u \end{pmatrix} \\ a_3 &= \begin{pmatrix} 0.0447625u^{15} + 0.460626u^{14} + \dots + 3.21864u + 2.08536 \\ -u^2 \end{pmatrix} \\ a_6 &= \begin{pmatrix} 0 \\ u \end{pmatrix} \\ a_5 &= \begin{pmatrix} -u \\ u \end{pmatrix} \\ a_{11} &= \begin{pmatrix} -0.669500u^{15} - 0.696727u^{14} + \dots + 3.63251u + 2.08851 \\ -0.415864u^{15} - 0.343874u^{14} + \dots - 2.04060u + 0.0447625 \end{pmatrix} \\ a_9 &= \begin{pmatrix} -1.08536u^{15} - 1.04060u^{14} + \dots + 2.59191u + 2.13328 \\ -0.415864u^{15} - 0.343874u^{14} + \dots - 2.04060u + 0.0447625 \end{pmatrix} \\ a_7 &= \begin{pmatrix} -2.44620u^{15} - 3.01318u^{14} + \dots - 15.2432u - 4.30357 \\ 0.426125u^{15} + 0.254546u^{14} + \dots - 0.972576u - 0.611737 \end{pmatrix} \\ a_1 &= \begin{pmatrix} 1.54632u^{15} + 2.19910u^{14} + \dots + 15.5758u + 1.14373 \\ -0.249474u^{15} - 0.181065u^{14} + \dots + 1.04652u + 0.985118 \end{pmatrix} \\ a_8 &= \begin{pmatrix} -1.41771u^{15} - 1.56931u^{14} + \dots - 2.59461u + 0.648356 \\ -0.241528u^{15} - 0.216742u^{14} + \dots - 1.78606u - 0.126817 \end{pmatrix} \\ a_4 &= \begin{pmatrix} 0.753512u^{15} + 0.409978u^{14} + \dots - 7.30071u - 4.54106 \\ 0.567298u^{15} + 0.602131u^{14} + \dots + 2.01211u - 0.308700 \end{pmatrix} \\ a_4 &= \begin{pmatrix} 0.753512u^{15} + 0.409978u^{14} + \dots - 7.30071u - 4.54106 \\ 0.567298u^{15} + 0.602131u^{14} + \dots + 2.01211u - 0.308700 \end{pmatrix} \end{aligned}$$

(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
$u = -1.13680 - 1.17673I$ $a = -0.351780 - 0.653496I$ $b = 1.13680 + 1.17673I$	$3.58132 + 5.91907I$	$-0.02049 - 8.16668I$
$u = -1.13680 + 1.17673I$ $a = -0.351780 + 0.653496I$ $b = 1.13680 - 1.17673I$	$3.58132 - 5.91907I$	$-0.02049 + 8.16668I$
$u = -0.833985 - 1.005379I$ $a = -0.630787 - 0.367926I$ $b = 0.833985 + 1.005379I$	$2.04808 - 7.98268I$	$4.81427 + 4.30375I$
$u = -0.833985 + 1.005379I$ $a = -0.630787 + 0.367926I$ $b = 0.833985 - 1.005379I$	$2.04808 + 7.98268I$	$4.81427 - 4.30375I$
$u = -0.468248 - 0.352677I$ $a = -0.68919 - 2.58423I$ $b = 0.468248 + 0.352677I$	$0.88608 + 3.10886I$	$7.3004 - 13.1054I$
$u = -0.468248 + 0.352677I$ $a = -0.68919 + 2.58423I$ $b = 0.468248 - 0.352677I$	$0.88608 - 3.10886I$	$7.3004 + 13.1054I$
$u = -0.368009 - 0.981568I$ $a = 0.406025 + 0.005030I$ $b = 0.368009 + 0.981568I$	$0.88608 + 3.10886I$	$7.3004 - 13.1054I$
$u = -0.368009 + 0.981568I$ $a = 0.406025 - 0.005030I$ $b = 0.368009 - 0.981568I$	$0.88608 - 3.10886I$	$7.3004 + 13.1054I$
$u = 0.126722 - 0.399203I$ $a = 3.78240 - 0.86648I$ $b = -0.126722 + 0.399203I$	$3.58132 - 5.91907I$	$-0.02049 + 8.16668I$
$u = 0.126722 + 0.399203I$ $a = 3.78240 + 0.86648I$ $b = -0.126722 - 0.399203I$	$3.58132 + 5.91907I$	$-0.02049 - 8.16668I$

Solution to $I_5^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.448678 - 0.874321I$	$-2.40315 - 2.04689I$	$-0.09415 + 3.67599I$
$a = -0.462781 - 1.075287I$		
$b = -0.448678 + 0.874321I$		
$u = 0.448678 + 0.874321I$	$-2.40315 + 2.04689I$	$-0.09415 - 3.67599I$
$a = -0.462781 + 1.075287I$		
$b = -0.448678 - 0.874321I$		
$u = 0.723898 - 1.047534I$	$-2.40315 + 2.04689I$	$-0.09415 - 3.67599I$
$a = 0.528322 - 0.354250I$		
$b = -0.723898 + 1.047534I$		
$u = 0.723898 + 1.047534I$	$-2.40315 - 2.04689I$	$-0.09415 + 3.67599I$
$a = 0.528322 + 0.354250I$		
$b = -0.723898 - 1.047534I$		
$u = 1.00775 - 1.04644I$	$2.04808 - 7.98268I$	$4.81427 + 4.30375I$
$a = 0.417789 - 0.928792I$		
$b = -1.00775 + 1.04644I$		
$u = 1.00775 + 1.04644I$	$2.04808 + 7.98268I$	$4.81427 - 4.30375I$
$a = 0.417789 + 0.928792I$		
$b = -1.00775 - 1.04644I$		

$$\text{VI. } I_6^u = \langle u^{22} + 2u^{21} + \cdots - u + 1, b - u, 2.57 \times 10^9 u^{21} - 7.86 \times 10^8 u^{20} + \cdots + 7.99 \times 10^8 a - 2.54 \times 10^{10} \rangle$$

(i) Arc colorings

$$\begin{aligned} a_2 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_{10} &= \begin{pmatrix} -3.21814u^{21} + 0.983576u^{20} + \cdots + 53.2440u + 31.7750 \\ u \end{pmatrix} \\ a_3 &= \begin{pmatrix} -7.41986u^{21} - 27.7579u^{20} + \cdots - 28.5569u - 2.21814 \\ -u^2 \end{pmatrix} \\ a_6 &= \begin{pmatrix} 0 \\ u \end{pmatrix} \\ a_5 &= \begin{pmatrix} -u \\ u \end{pmatrix} \\ a_{11} &= \begin{pmatrix} 9.70002u^{21} + 40.8352u^{20} + \cdots + 63.8820u + 24.3552 \\ -12.9182u^{21} - 39.8516u^{20} + \cdots - 9.63800u + 7.41986 \end{pmatrix} \\ a_9 &= \begin{pmatrix} -3.21814u^{21} + 0.983576u^{20} + \cdots + 53.2440u + 31.7750 \\ -12.9182u^{21} - 39.8516u^{20} + \cdots - 9.63800u + 7.41986 \end{pmatrix} \\ a_7 &= \begin{pmatrix} 36.8651u^{21} + 101.006u^{20} + \cdots + 6.00674u - 62.8048 \\ -30.4757u^{21} - 86.8462u^{20} + \cdots - 0.0486200u + 34.6956 \end{pmatrix} \\ a_1 &= \begin{pmatrix} 17.5659u^{21} + 43.4635u^{20} + \cdots - 25.5053u - 47.6472 \\ -36.4150u^{21} - 101.142u^{20} + \cdots + 19.2019u + 48.3018 \end{pmatrix} \\ a_8 &= \begin{pmatrix} 36.7519u^{21} + 115.157u^{20} + \cdots + 48.3272u - 18.1628 \\ -34.8134u^{21} - 101.962u^{20} + \cdots - 5.05718u + 33.3147 \end{pmatrix} \\ a_4 &= \begin{pmatrix} -20.4440u^{21} - 70.7204u^{20} + \cdots - 46.0920u - 12.7855 \\ 9.01224u^{21} + 26.9074u^{20} + \cdots + 1.47262u - 6.44843 \end{pmatrix} \\ a_4 &= \begin{pmatrix} -20.4440u^{21} - 70.7204u^{20} + \cdots - 46.0920u - 12.7855 \\ 9.01224u^{21} + 26.9074u^{20} + \cdots + 1.47262u - 6.44843 \end{pmatrix} \end{aligned}$$

(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
$u = -1.26965 - 1.19997I$ $a = 0.276672 + 0.631356I$ $b = -1.26965 - 1.19997I$	$3.91310 + 5.97461I$	$23.9284 - 13.7192I$
$u = -1.26965 + 1.19997I$ $a = 0.276672 - 0.631356I$ $b = -1.26965 + 1.19997I$	$3.91310 - 5.97461I$	$23.9284 + 13.7192I$
$u = -1.233034 - 0.635865I$ $a = 0.047787 + 0.904859I$ $b = -1.233034 - 0.635865I$	$3.59155 + 3.95294I$	$13.25217 - 1.78901I$
$u = -1.233034 + 0.635865I$ $a = 0.047787 - 0.904859I$ $b = -1.233034 + 0.635865I$	$3.59155 - 3.95294I$	$13.25217 + 1.78901I$
$u = -1.063557 - 0.786366I$ $a = 0.346335 + 0.615806I$ $b = -1.063557 - 0.786366I$	$2.66286 + 2.55524I$	$8.64051 - 2.98354I$
$u = -1.063557 + 0.786366I$ $a = 0.346335 - 0.615806I$ $b = -1.063557 + 0.786366I$	$2.66286 - 2.55524I$	$8.64051 + 2.98354I$
$u = -0.764183 - 0.949488I$ $a = -0.622997 + 0.737336I$ $b = -0.764183 - 0.949488I$	$-1.29847 + 12.74385I$	$2.12242 - 8.78453I$
$u = -0.764183 + 0.949488I$ $a = -0.622997 - 0.737336I$ $b = -0.764183 + 0.949488I$	$-1.29847 - 12.74385I$	$2.12242 + 8.78453I$
$u = -0.692955 - 0.824926I$ $a = -0.386999 + 0.206733I$ $b = -0.692955 - 0.824926I$	$1.19109 + 2.38125I$	$9.20735 - 4.36639I$
$u = -0.692955 + 0.824926I$ $a = -0.386999 - 0.206733I$ $b = -0.692955 + 0.824926I$	$1.19109 - 2.38125I$	$9.20735 + 4.36639I$

Solution to $I_6^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.363872 - 0.119625I$ $a = -2.63086 - 4.15454I$ $b = -0.363872 - 0.119625I$	$3.91310 + 5.97461I$	$23.9284 - 13.7192I$
$u = -0.363872 + 0.119625I$ $a = -2.63086 + 4.15454I$ $b = -0.363872 + 0.119625I$	$3.91310 - 5.97461I$	$23.9284 + 13.7192I$
$u = 0.476892 - 0.061840I$ $a = -0.33806 + 2.84622I$ $b = 0.476892 - 0.061840I$	$1.19109 + 2.38125I$	$9.20735 - 4.36639I$
$u = 0.476892 + 0.061840I$ $a = -0.33806 - 2.84622I$ $b = 0.476892 + 0.061840I$	$1.19109 - 2.38125I$	$9.20735 + 4.36639I$
$u = 0.710834 - 0.065637I$ $a = 1.51199 + 0.86453I$ $b = 0.710834 - 0.065637I$	$3.59155 + 3.95294I$	$13.25217 - 1.78901I$
$u = 0.710834 + 0.065637I$ $a = 1.51199 - 0.86453I$ $b = 0.710834 + 0.065637I$	$3.59155 - 3.95294I$	$13.25217 + 1.78901I$
$u = 0.865794 - 0.005763I$ $a = -0.133958 - 0.850311I$ $b = 0.865794 - 0.005763I$	$2.66286 - 2.55524I$	$8.64051 + 2.98354I$
$u = 0.865794 + 0.005763I$ $a = -0.133958 + 0.850311I$ $b = 0.865794 + 0.005763I$	$2.66286 + 2.55524I$	$8.64051 - 2.98354I$
$u = 1.096643 - 0.608492I$ $a = -0.311023 + 1.044407I$ $b = 1.096643 - 0.608492I$	$9.48854$	$11.6982$
$u = 1.096643 + 0.608492I$ $a = -0.311023 - 1.044407I$ $b = 1.096643 + 0.608492I$	$9.48854$	$11.6982$
Solution to $I_6^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.23709 - 1.11266I$ $a = -0.258880 + 0.796749I$ $b = 1.23709 - 1.11266I$	$-1.29847 - 12.74385I$	$2.12242 + 8.78453I$
$u = 1.23709 + 1.11266I$ $a = -0.258880 - 0.796749I$ $b = 1.23709 + 1.11266I$	$-1.29847 + 12.74385I$	$2.12242 - 8.78453I$

$$\text{VII. } I_7^u = \langle u^{48} + 3u^{47} + \dots - 14u + 7, -1.20 \times 10^{112}u^{47} - 3.68 \times 10^{112}u^{46} + \dots + 8.04 \times 10^{112}a - 4.03 \times 10^{112}, -2.03 \times 10^{116}u^{47} - 6.04 \times 10^{116}u^{46} + \dots + 2.04 \times 10^{117}b + 2.40 \times 10^{117} \rangle$$

(i) Arc colorings

$$\begin{aligned} a_2 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_{10} &= \begin{pmatrix} 0.149817u^{47} + 0.458062u^{46} + \dots - 4.94463u + 0.501937 \\ 0.0991401u^{47} + 0.295645u^{46} + \dots + 12.2428u - 1.17655 \end{pmatrix} \\ a_3 &= \begin{pmatrix} -0.0155844u^{47} + 0.0454001u^{46} + \dots - 13.2654u - 2.19548 \\ 0.0749769u^{47} + 0.299051u^{46} + \dots - 2.18533u + 7.61807 \end{pmatrix} \\ a_6 &= \begin{pmatrix} 0 \\ u \end{pmatrix} \\ a_5 &= \begin{pmatrix} -u \\ u \end{pmatrix} \\ a_{11} &= \begin{pmatrix} 0.123292u^{47} + 0.379363u^{46} + \dots - 6.59163u + 0.454087 \\ 0.125665u^{47} + 0.374343u^{46} + \dots + 13.8898u - 1.12870 \end{pmatrix} \\ a_9 &= \begin{pmatrix} 0.149817u^{47} + 0.458062u^{46} + \dots - 4.94463u + 0.501937 \\ 0.128039u^{47} + 0.378918u^{46} + \dots + 13.1710u - 1.11627 \end{pmatrix} \\ a_7 &= \begin{pmatrix} -0.152327u^{47} - 0.477500u^{46} + \dots - 11.1137u + 1.63205 \\ 0.0835107u^{47} + 0.261325u^{46} + \dots - 3.19269u - 0.0345431 \end{pmatrix} \\ a_1 &= \begin{pmatrix} 0.0245531u^{47} + 0.0953909u^{46} + \dots - 8.70618u - 5.15291 \\ 0.0683035u^{47} + 0.286389u^{46} + \dots + 0.805889u + 4.42557 \end{pmatrix} \\ a_8 &= \begin{pmatrix} -0.0879422u^{47} - 0.283487u^{46} + \dots + 7.47034u + 0.811149 \\ -0.157745u^{47} - 0.479231u^{46} + \dots - 14.1015u + 0.454000 \end{pmatrix} \\ a_4 &= \begin{pmatrix} -0.167617u^{47} - 0.535067u^{46} + \dots - 20.0241u + 0.0226571 \\ 0.231530u^{47} + 0.741131u^{46} + \dots + 5.07161u - 1.24788 \end{pmatrix} \\ a_4 &= \begin{pmatrix} -0.167617u^{47} - 0.535067u^{46} + \dots - 20.0241u + 0.0226571 \\ 0.231530u^{47} + 0.741131u^{46} + \dots + 5.07161u - 1.24788 \end{pmatrix} \end{aligned}$$

(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
$u = -1.45679 - 0.39389I$ $a = -0.083100 + 0.331190I$ $b = 0.253152 - 0.971646I$	$0.62485 - 6.58801I$	$0.25324 + 5.23459I$
$u = -1.45679 + 0.39389I$ $a = -0.083100 - 0.331190I$ $b = 0.253152 + 0.971646I$	$0.62485 + 6.58801I$	$0.25324 - 5.23459I$
$u = -1.41318 - 2.05306I$ $a = -0.384517 - 0.150429I$ $b = 0.212046 - 0.211827I$	$2.07792 - 8.99540I$	$4.0283 + 14.0385I$
$u = -1.41318 + 2.05306I$ $a = -0.384517 + 0.150429I$ $b = 0.212046 + 0.211827I$	$2.07792 + 8.99540I$	$4.0283 - 14.0385I$
$u = -1.25894 - 1.09149I$ $a = -0.249707 - 0.772718I$ $b = 0.816916 + 0.968854I$	$0.62485 + 6.58801I$	$0.25324 - 5.23459I$
$u = -1.25894 + 1.09149I$ $a = -0.249707 + 0.772718I$ $b = 0.816916 - 0.968854I$	$0.62485 - 6.58801I$	$0.25324 + 5.23459I$
$u = -1.131838 - 0.654685I$ $a = 0.228425 + 0.753176I$ $b = -0.22904 - 1.51797I$	$2.07792 + 4.93563I$	$4.02829 - 7.11030I$
$u = -1.131838 + 0.654685I$ $a = 0.228425 - 0.753176I$ $b = -0.22904 + 1.51797I$	$2.07792 - 4.93563I$	$4.02829 + 7.11030I$
$u = -0.85749 - 1.22119I$ $a = -0.559198 - 0.845015I$ $b = 1.22673 + 0.90431I$	$2.07792 + 8.99540I$	$4.0283 - 14.0385I$
$u = -0.85749 + 1.22119I$ $a = -0.559198 + 0.845015I$ $b = 1.22673 - 0.90431I$	$2.07792 - 8.99540I$	$4.0283 + 14.0385I$

Solution to $I_7^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.619548 - 0.991194I$		
$a = -0.440314 - 0.021473I$	$0.62485 + 2.52824I$	$0.25324 + 1.69361I$
$b = 0.038774 - 0.733952I$		
$u = -0.619548 + 0.991194I$		
$a = -0.440314 + 0.021473I$	$0.62485 - 2.52824I$	$0.25324 - 1.69361I$
$b = 0.038774 + 0.733952I$		
$u = -0.537490 - 1.055823I$		
$a = 0.523149 - 0.766326I$	$-2.70277 + 0.94726I$	$-4.28153 + 2.16352I$
$b = 0.319731 + 0.721848I$		
$u = -0.537490 + 1.055823I$		
$a = 0.523149 + 0.766326I$	$-2.70277 - 0.94726I$	$-4.28153 - 2.16352I$
$b = 0.319731 - 0.721848I$		
$u = -0.437562 - 0.344284I$		
$a = -0.78343 - 2.60022I$	$2.07792 + 4.93563I$	$4.02829 - 7.11030I$
$b = 0.527372 + 0.822492I$		
$u = -0.437562 + 0.344284I$		
$a = -0.78343 + 2.60022I$	$2.07792 - 4.93563I$	$4.02829 + 7.11030I$
$b = 0.527372 - 0.822492I$		
$u = -0.348815 - 0.911669I$		
$a = 0.264750 - 1.094633I$	$-2.70277 + 3.11251I$	$-4.28153 - 9.09172I$
$b = 0.746925 + 0.933267I$		
$u = -0.348815 + 0.911669I$		
$a = 0.264750 + 1.094633I$	$-2.70277 - 3.11251I$	$-4.28153 + 9.09172I$
$b = 0.746925 - 0.933267I$		
$u = -0.22904 - 1.51797I$		
$a = 0.622616 + 0.248462I$	$2.07792 + 4.93563I$	$4.02829 - 7.11030I$
$b = -1.131838 - 0.654685I$		
$u = -0.22904 + 1.51797I$		
$a = 0.622616 - 0.248462I$	$2.07792 - 4.93563I$	$4.02829 + 7.11030I$
$b = -1.131838 + 0.654685I$		

Solution to $I_7^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.223576 - 0.582679I$ $a = -1.55933 - 1.50628I$ $b = 0.550794 + 0.261194I$	$0.62485 + 2.52824I$	$0.25324 + 1.69361I$
$u = -0.223576 + 0.582679I$ $a = -1.55933 + 1.50628I$ $b = 0.550794 - 0.261194I$	$0.62485 - 2.52824I$	$0.25324 - 1.69361I$
$u = -0.082567 - 0.311441I$ $a = 2.30533 + 1.20740I$ $b = 0.69044 - 2.01862I$	$-2.70277 + 3.11251I$	$-4.28153 - 9.09172I$
$u = -0.082567 + 0.311441I$ $a = 2.30533 - 1.20740I$ $b = 0.69044 + 2.01862I$	$-2.70277 - 3.11251I$	$-4.28153 + 9.09172I$
$u = 0.006229 - 0.983343I$ $a = -0.830288 + 0.194093I$ $b = 1.70773 - 0.70812I$	$-2.70277 + 0.94726I$	$-4.28153 + 2.16352I$
$u = 0.006229 + 0.983343I$ $a = -0.830288 - 0.194093I$ $b = 1.70773 + 0.70812I$	$-2.70277 - 0.94726I$	$-4.28153 - 2.16352I$
$u = 0.038774 - 0.733952I$ $a = -0.593006 + 0.374009I$ $b = -0.619548 - 0.991194I$	$0.62485 + 2.52824I$	$0.25324 + 1.69361I$
$u = 0.038774 + 0.733952I$ $a = -0.593006 - 0.374009I$ $b = -0.619548 + 0.991194I$	$0.62485 - 2.52824I$	$0.25324 - 1.69361I$
$u = 0.212046 - 0.211827I$ $a = -1.80909 + 2.91825I$ $b = -1.41318 - 2.05306I$	$2.07792 - 8.99540I$	$4.0283 + 14.0385I$
$u = 0.212046 + 0.211827I$ $a = -1.80909 - 2.91825I$ $b = -1.41318 + 2.05306I$	$2.07792 + 8.99540I$	$4.0283 - 14.0385I$

Solution to $I_7^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.253152 - 0.971646I$ $a = 0.496596 + 0.129468I$ $b = -1.45679 - 0.39389I$	$0.62485 - 6.58801I$	$0.25324 + 5.23459I$
$u = 0.253152 + 0.971646I$ $a = 0.496596 - 0.129468I$ $b = -1.45679 + 0.39389I$	$0.62485 + 6.58801I$	$0.25324 - 5.23459I$
$u = 0.319731 - 0.721848I$ $a = -0.721957 - 1.190637I$ $b = -0.537490 + 1.055823I$	$-2.70277 - 0.94726I$	$-4.28153 - 2.16352I$
$u = 0.319731 + 0.721848I$ $a = -0.721957 + 1.190637I$ $b = -0.537490 - 1.055823I$	$-2.70277 + 0.94726I$	$-4.28153 + 2.16352I$
$u = 0.527372 - 0.822492I$ $a = 0.90750 - 1.25351I$ $b = -0.437562 + 0.344284I$	$2.07792 - 4.93563I$	$4.02829 + 7.11030I$
$u = 0.527372 + 0.822492I$ $a = 0.90750 + 1.25351I$ $b = -0.437562 - 0.344284I$	$2.07792 + 4.93563I$	$4.02829 - 7.11030I$
$u = 0.550794 - 0.261194I$ $a = 0.09118 - 2.21778I$ $b = -0.223576 + 0.582679I$	$0.62485 - 2.52824I$	$0.25324 - 1.69361I$
$u = 0.550794 + 0.261194I$ $a = 0.09118 + 2.21778I$ $b = -0.223576 - 0.582679I$	$0.62485 + 2.52824I$	$0.25324 + 1.69361I$
$u = 0.69044 - 2.01862I$ $a = 0.390805 - 0.041682I$ $b = -0.082567 - 0.311441I$	$-2.70277 + 3.11251I$	$-4.28153 - 9.09172I$
$u = 0.69044 + 2.01862I$ $a = 0.390805 + 0.041682I$ $b = -0.082567 + 0.311441I$	$-2.70277 - 3.11251I$	$-4.28153 + 9.09172I$

Solution to $I_7^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.746925 - 0.933267I$ $a = -0.478191 - 0.785540I$ $b = -0.348815 + 0.911669I$	$-2.70277 - 3.11251I$	$-4.28153 + 9.09172I$
$u = 0.746925 + 0.933267I$ $a = -0.478191 + 0.785540I$ $b = -0.348815 - 0.911669I$	$-2.70277 + 3.11251I$	$-4.28153 - 9.09172I$
$u = 0.816916 - 0.968854I$ $a = 0.482172 - 0.952613I$ $b = -1.25894 + 1.09149I$	$0.62485 - 6.58801I$	$0.25324 + 5.23459I$
$u = 0.816916 + 0.968854I$ $a = 0.482172 + 0.952613I$ $b = -1.25894 - 1.09149I$	$0.62485 + 6.58801I$	$0.25324 - 5.23459I$
$u = 1.22673 - 0.90431I$ $a = 0.256232 - 0.958458I$ $b = -0.85749 + 1.22119I$	$2.07792 - 8.99540I$	$4.0283 + 14.0385I$
$u = 1.22673 + 0.90431I$ $a = 0.256232 + 0.958458I$ $b = -0.85749 - 1.22119I$	$2.07792 + 8.99540I$	$4.0283 - 14.0385I$
$u = 1.70773 - 0.70812I$ $a = -0.076629 + 0.447029I$ $b = 0.006229 - 0.983343I$	$-2.70277 + 0.94726I$	$-4.28153 + 2.16352I$
$u = 1.70773 + 0.70812I$ $a = -0.076629 - 0.447029I$ $b = 0.006229 + 0.983343I$	$-2.70277 - 0.94726I$	$-4.28153 - 2.16352I$



VIII.  $I_{\mathfrak{g}}^u = \langle u^2 - u + 1, b, a + 1 \rangle$

(i) Arc colorings

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

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

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

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

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

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

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

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

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

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

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

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

(ii) Obstruction class =  $-1$

(iii) Cusp Shapes = unknown

(iv) Complex Volumes and Cusp Shapes

Solution to $J_g^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.500000 - 0.866025I$ $a = -1.00000$ $b = 0$	$2.02988I$	$-3.46410I$
$u = 0.500000 + 0.866025I$ $a = -1.00000$ $b = 0$	$-2.02988I$	$3.46410I$

$$\text{IX. } I_9^u = \langle u^2 - u + 1, a - u, b + u + 1 \rangle$$

(i) Arc colorings

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

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

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

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

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

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

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

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

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

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

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

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

(ii) Obstruction class = -1

(iii) Cusp Shapes = unknown

(iv) Complex Volumes and Cusp Shapes

	Solution to $I_9^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u =$	$0.500000 - 0.866025I$		
$a =$	$0.500000 - 0.866025I$	$-6.08965I$	$10.3923I$
$b =$	$-1.50000 + 0.86603I$		
$u =$	$0.500000 + 0.866025I$		
$a =$	$0.500000 + 0.866025I$	$6.08965I$	$-10.3923I$
$b =$	$-1.50000 - 0.86603I$		

$$\mathbf{X. } I_1^v = \langle v - 1, b^2 - b + 1, a \rangle$$

**(i) Arc colorings**

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

$$a_{10} = \begin{pmatrix} 0 \\ b \end{pmatrix}$$

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

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

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

$$a_{11} = \begin{pmatrix} b \\ b \end{pmatrix}$$

$$a_9 = \begin{pmatrix} b \\ b \end{pmatrix}$$

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

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

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

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

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

**(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
$v = 1.00000$		
$a = 0$	$2.02988I$	$-3.46410I$
$b = 0.500000 - 0.866025I$		
$v = 1.00000$		
$a = 0$	$-2.02988I$	$3.46410I$
$b = 0.500000 + 0.866025I$		

## XI. u-Polynomials

Crossings	u-Polynomials at each crossings
$c_1, c_8$	$u^2(u^2 - u + 1)^4(u^{11} - u^9 + u^8 + 2u^7 - 2u^6 - 5u^5 - 3u^4 - u^2 - 2u - 1)^2$ $(u^{12} + 5u^{11} + \dots + 50u + 25)(u^{15} + 5u^{13} + \dots + 4u - 4)$ $(u^{16} + u^{14} + 8u^{12} - 4u^{10} + 9u^8 - 11u^6 + 18u^4 - 2u^2 + 7)$ $(1 - 10u + 60u^2 - 46u^3 + 416u^4 - 54u^5 + 686u^6 - 142u^7 + 520u^8 - 170u^9 + 323u^{10} - 68u^{11})$
$c_2, c_5$	$u^2(u^2 - u + 1)^3(u^2 + 3u + 3)$ $(u^{12} + u^{11} + 5u^9 + 12u^8 + 5u^7 - 5u^6 - 9u^5 + 8u^3 + 4u^2 - 4u + 1)$ $(u^{15} - 3u^{13} + \dots + u + 1)(u^{16} - u^{15} + \dots - u + 1)$ $(u^{22} + 2u^{21} + \dots - u + 1)(u^{48} + 3u^{47} + \dots - 14u + 7)$
$c_3, c_9$	$(u^2 + u + 1)^5(u^3 + u^2 + 2u + 1)^4$ $(1 + 4u^2 + 6u^3 + 10u^4 + 17u^5 + 19u^6 + 21u^7 + 18u^8 + 13u^9 + 8u^{10} + 3u^{11} + u^{12})^4$ $(u^{15} - 5u^{14} + \dots + 18u - 4)(u^{16} + 5u^{15} + \dots + 13u + 3)$ $(u^{22} - 10u^{21} + \dots - 121u + 13)$
$c_4, c_7$	$u^2(u^2 - u + 1)^2(u^2 + u + 1)(u^2 + 3u + 3)$ $(u^{12} + u^{11} + 5u^9 + 12u^8 + 5u^7 - 5u^6 - 9u^5 + 8u^3 + 4u^2 - 4u + 1)$ $(u^{15} - 3u^{13} + \dots + u + 1)(u^{16} + u^{15} + \dots + u + 1)$ $(u^{22} + 2u^{21} + \dots - u + 1)(u^{48} + 3u^{47} + \dots - 14u + 7)$
$c_6, c_{11}$	$(u^2 - u + 1)(u^2 + u + 1)^4(u^3 + u^2 + 2u + 1)^4$ $(1 + 4u^2 + 6u^3 + 10u^4 + 17u^5 + 19u^6 + 21u^7 + 18u^8 + 13u^9 + 8u^{10} + 3u^{11} + u^{12})^4$ $(u^{15} - 5u^{14} + \dots + 18u - 4)(u^{16} - 5u^{15} + \dots - 13u + 3)$ $(u^{22} - 10u^{21} + \dots - 121u + 13)$
$c_{10}$	$u^2(u^2 + u + 1)^{34}$ $(-64 + 288u - 672u^2 + 1040u^3 - 1176u^4 + 1020u^5 - 689u^6 + 363u^7 - 147u^8 + 44u^9 - 9u^{10} - \dots)$ $(u^{15} - 11u^{14} + \dots + 176u - 32)$ $(u^{16} + 7u^{14} + 23u^{12} + 47u^{10} + 66u^8 + 62u^6 + 46u^4 + 20u^2 + 7)$

## XII. Riley Polynomials

Crossings	Riley Polynomials at each crossings
$c_1, c_8$	$y^2(y^2 + y + 1)^4(y^8 + y^7 + 8y^6 - 4y^5 + 9y^4 - 11y^3 + 18y^2 - 2y + 7)^2$ $(-1 + 2y - 7y^2 + 10y^3 - 19y^4 + 19y^5 - 22y^6 + 18y^7 - 15y^8 + 5y^9 - 2y^{10} + y^{11})^2$ $(y^{12} - 13y^{11} + \dots - 1400y + 625)(y^{15} + 10y^{14} + \dots - 96y - 16)$ $(1 + 20y + 3512y^2 + 4.81 \times 10^4 y^3 + 2.49 \times 10^5 y^4 + 6.14 \times 10^5 y^5 + 9.10 \times 10^5 y^6 + 9.64 \times 10^5 y^7 + \dots)$
$c_2, c_4, c_5$ $c_7$	$y^2(y^2 - 3y + 9)(y^2 + y + 1)^3(y^{12} - y^{11} + \dots - 8y + 1)$ $(y^{15} - 6y^{14} + \dots + y - 1)(y^{16} + 5y^{15} + \dots + 11y + 1)$ $(y^{22} - 8y^{21} + \dots - 27y + 1)(y^{48} + 17y^{47} + \dots + 1428y + 49)$
$c_3, c_6, c_9$ $c_{11}$	$(y^2 + y + 1)^5(y^3 + 3y^2 + 2y - 1)^4$ $(1 + 8y + 36y^2 + 82y^3 + 84y^4 - y^5 - 83y^6 - 67y^7 + 31y^9 + 22y^{10} + 7y^{11} + y^{12})^4$ $(y^{15} + 9y^{14} + \dots + 12y - 16)(y^{16} + 15y^{15} + \dots + 137y + 9)$ $(y^{22} + 18y^{21} + \dots + 335y + 169)$
$c_{10}$	$y^2(y^2 + y + 1)^{34}$ $(y^8 + 7y^7 + 23y^6 + 47y^5 + 66y^4 + 62y^3 + 46y^2 + 20y + 7)^2$ $(-4096 - 3072y - 3072y^2 + 384y^3 + 2880y^4 + 1536y^5 + 55y^6 - 125y^7 - 27y^8 + 16y^9 + 7y^{10} - \dots)$ $(y^{15} + y^{14} + \dots + 768y - 1024)$