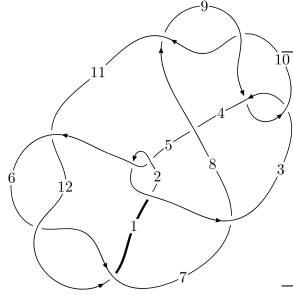
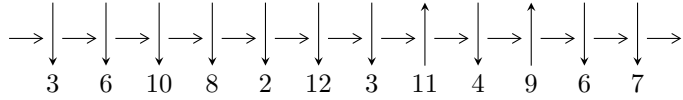


12n<sub>0387</sub> (K12n<sub>0387</sub>)



A knot diagram<sup>1</sup>

**Linearized knot diagram**



**Solving Sequence**

$$4,9 \xrightarrow{c_9} 10 \xrightarrow{c_{10}} 6,11 \xrightarrow{c_{11}} 12 \xrightarrow{c_3} 3 \xrightarrow{c_2} 2 \xrightarrow{c_1} 1 \xrightarrow{c_5} 5 \xrightarrow{c_8} 8 \xrightarrow{c_7} 7 \twoheadrightarrow c_4, c_6, c_{12}$$

**Ideals for irreducible components<sup>2</sup> of  $X_{\text{par}}$**

$$I_1^u = \langle -2u^{14} + 3u^{13} - 7u^{12} + 6u^{11} - 13u^{10} + 6u^9 - 12u^8 - 9u^6 - 10u^5 + u^4 - 13u^3 + u^2 + b - 7u - 3, \\ 3u^{15} - 9u^{14} + \dots + 2a - 8, u^{16} - 3u^{15} + \dots + 2u + 2 \rangle$$

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

$$I_3^u = \langle -u^3 + au - u^2 + b + 1, -u^3a - 2u^2a + u^3 + a^2 - 2au - 2u^2 - 1, u^4 + u^3 + u^2 + 1 \rangle$$

$$I_4^u = \langle -u^3 - u^2 + b + 1, -u^3 - u^2 + a - u, u^4 + 1 \rangle$$

$$I_5^u = \langle b - u, a - 1, u^2 + 1 \rangle$$

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

\* 6 irreducible components of  $\dim_{\mathbb{C}} = 0$ , with total 35 representations.

<sup>1</sup>The image of knot diagram is generated by the software “**Draw programme**” developed by Andrew Bartholomew(<http://www.layer8.co.uk/maths/draw/index.htm#Running-draw>), where we modified some parts for our purpose(<https://github.com/CATsTAILs/LinksPainter>).

<sup>2</sup>All coefficients of polynomials are rational numbers. But the coefficients are sometimes approximated in decimal forms when there is not enough margin.

$$I_1^u = \langle -2u^{14} + 3u^{13} + \dots + b - 3, 3u^{15} - 9u^{14} + \dots + 2a - 8, u^{16} - 3u^{15} + \dots + 2u + 2 \rangle \quad \text{I.}$$

(i) Arc colorings

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

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

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

$$a_6 = \begin{pmatrix} -\frac{3}{2}u^{15} + \frac{9}{2}u^{14} + \dots + 5u + 4 \\ 2u^{14} - 3u^{13} + \dots + 7u + 3 \end{pmatrix}$$

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

$$a_{12} = \begin{pmatrix} -\frac{1}{2}u^{15} + \frac{1}{2}u^{14} + \dots + \frac{3}{2}u^3 + 1 \\ -u^{15} + 2u^{14} + \dots + u + 1 \end{pmatrix}$$

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

$$a_2 = \begin{pmatrix} -\frac{1}{2}u^{15} + \frac{1}{2}u^{14} + \dots - u^2 + u \\ -u^{15} + 2u^{14} + \dots + 2u + 1 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -\frac{3}{2}u^{15} + \frac{3}{2}u^{14} + \dots + \frac{3}{2}u^3 - 3u^2 \\ -4u^{15} + 9u^{14} + \dots + 7u + 5 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -u^9 - 2u^7 - 3u^5 - 2u^3 - u \\ -u^9 - u^7 - u^5 + u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} u^4 + u^2 + 1 \\ u^4 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -u^8 - u^6 - u^4 + 1 \\ -u^{10} - 2u^8 - 3u^6 - 2u^4 - u^2 \end{pmatrix}$$

(ii) Obstruction class = -1

$$\text{(iii) Cusp Shapes} = 2u^{15} - 8u^{14} + 12u^{13} - 18u^{12} + 18u^{11} - 28u^{10} + 12u^9 - 16u^8 - 2u^7 - 8u^6 - 30u^5 + 10u^4 - 20u^3 - 4u^2 - 10u - 20$$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
$c_1$	$u^{16} + 31u^{15} + \dots + 18u + 1$
$c_2, c_5, c_6$ $c_{11}, c_{12}$	$u^{16} + u^{15} + \dots + 9u^2 - 1$
$c_3, c_9$	$u^{16} - 3u^{15} + \dots + 2u + 2$
$c_4$	$u^{16} + 15u^{15} + \dots + 1866u + 314$
$c_7$	$u^{16} - 3u^{15} + \dots + 110u + 50$
$c_8, c_{10}$	$u^{16} - 5u^{15} + \dots + 20u + 4$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
$c_1$	$y^{16} - 119y^{15} + \dots - 66y + 1$
$c_2, c_5, c_6$ $c_{11}, c_{12}$	$y^{16} - 31y^{15} + \dots - 18y + 1$
$c_3, c_9$	$y^{16} + 5y^{15} + \dots - 20y + 4$
$c_4$	$y^{16} - 7y^{15} + \dots - 540404y + 98596$
$c_7$	$y^{16} - 75y^{15} + \dots + 55500y + 2500$
$c_8, c_{10}$	$y^{16} + 13y^{15} + \dots - 1008y + 16$

(vi) Complex Volumes and Cusp Shapes

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.742751 + 0.731255I$ $a = 0.435126 + 1.127490I$ $b = -0.501292 + 1.155630I$	$-3.21485 + 0.54630I$	$-11.15141 - 2.56225I$
$u = 0.742751 - 0.731255I$ $a = 0.435126 - 1.127490I$ $b = -0.501292 - 1.155630I$	$-3.21485 - 0.54630I$	$-11.15141 + 2.56225I$
$u = -0.054006 + 0.927701I$ $a = 0.339113 - 0.403496I$ $b = 0.356009 + 0.336387I$	$2.06067 + 1.23650I$	$-2.66728 - 5.86350I$
$u = -0.054006 - 0.927701I$ $a = 0.339113 + 0.403496I$ $b = 0.356009 - 0.336387I$	$2.06067 - 1.23650I$	$-2.66728 + 5.86350I$
$u = -0.893186$ $a = -0.903219$ $b = 0.806743$	$-18.7411$	$-14.2280$
$u = -0.714194 + 0.883170I$ $a = 0.230746 + 0.032790I$ $b = -0.193757 + 0.180370I$	$-1.49390 + 2.73623I$	$-7.72446 - 2.31094I$
$u = -0.714194 - 0.883170I$ $a = 0.230746 - 0.032790I$ $b = -0.193757 - 0.180370I$	$-1.49390 - 2.73623I$	$-7.72446 + 2.31094I$
$u = 0.698495 + 0.969553I$ $a = -1.020710 - 0.642352I$ $b = -0.09016 - 1.43831I$	$-2.49093 - 6.04455I$	$-9.13130 + 8.50305I$
$u = 0.698495 - 0.969553I$ $a = -1.020710 + 0.642352I$ $b = -0.09016 + 1.43831I$	$-2.49093 + 6.04455I$	$-9.13130 - 8.50305I$
$u = 0.948967 + 0.727783I$ $a = -0.62477 - 2.29842I$ $b = 1.07987 - 2.63582I$	$16.2883 + 4.2323I$	$-14.03484 - 0.40975I$

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.948967 - 0.727783I$ $a = -0.62477 + 2.29842I$ $b = 1.07987 + 2.63582I$	$16.2883 - 4.2323I$	$-14.03484 + 0.40975I$
$u = -0.294487 + 1.168400I$ $a = -0.864463 + 0.293623I$ $b = -0.088495 - 1.096510I$	$-14.6982 + 4.0602I$	$-9.52226 - 2.84200I$
$u = -0.294487 - 1.168400I$ $a = -0.864463 - 0.293623I$ $b = -0.088495 + 1.096510I$	$-14.6982 - 4.0602I$	$-9.52226 + 2.84200I$
$u = 0.796357 + 1.060920I$ $a = 2.12200 + 0.97725I$ $b = 0.65309 + 3.02951I$	$17.3459 - 10.6503I$	$-12.77445 + 4.89153I$
$u = 0.796357 - 1.060920I$ $a = 2.12200 - 0.97725I$ $b = 0.65309 - 3.02951I$	$17.3459 + 10.6503I$	$-12.77445 - 4.89153I$
$u = -0.354580$ $a = 0.669122$ $b = -0.237257$	$-0.628198$	$-15.7600$

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

(i) Arc colorings

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

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

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

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

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

$$a_{12} = \begin{pmatrix} \frac{1}{2}u^3 + u^2 - \frac{1}{2}u \\ -u - 1 \end{pmatrix}$$

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

$$a_2 = \begin{pmatrix} \frac{1}{2}u^3 + \frac{1}{2}u - 1 \\ u^3 - u^2 - 1 \end{pmatrix}$$

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

$$a_5 = \begin{pmatrix} -u \\ -u^3 - u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -1 \\ -u^2 - 2 \end{pmatrix}$$

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

(ii) Obstruction class = 1

(iii) Cusp Shapes =  $4u^2 - 12$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
$c_1, c_5, c_{11}$ $c_{12}$	$(u - 1)^4$
$c_2, c_6$	$(u + 1)^4$
$c_3, c_4, c_7$ $c_9$	$u^4 + u^2 + 2$
$c_8$	$(u^2 + u + 2)^2$
$c_{10}$	$(u^2 - u + 2)^2$



(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
$c_1, c_2, c_5$ $c_6, c_{11}, c_{12}$	$(y - 1)^4$
$c_3, c_4, c_7$ $c_9$	$(y^2 + y + 2)^2$
$c_8, c_{10}$	$(y^2 + 3y + 4)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.676097 + 0.978318I$		
$a = -2.15417 - 0.28654I$	$-4.11234 - 5.33349I$	$-14.0000 + 5.2915I$
$b = -1.17610 - 2.30119I$		
$u = 0.676097 - 0.978318I$		
$a = -2.15417 + 0.28654I$	$-4.11234 + 5.33349I$	$-14.0000 - 5.2915I$
$b = -1.17610 + 2.30119I$		
$u = -0.676097 + 0.978318I$		
$a = 0.154169 - 0.286543I$	$-4.11234 + 5.33349I$	$-14.0000 - 5.2915I$
$b = 0.176097 + 0.344557I$		
$u = -0.676097 - 0.978318I$		
$a = 0.154169 + 0.286543I$	$-4.11234 - 5.33349I$	$-14.0000 + 5.2915I$
$b = 0.176097 - 0.344557I$		

III.

$$I_3^u = \langle -u^3 + au - u^2 + b + 1, -u^3a - 2u^2a + u^3 + a^2 - 2au - 2u^2 - 1, u^4 + u^3 + u^2 + 1 \rangle$$

(i) Arc colorings

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

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

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

$$a_6 = \begin{pmatrix} a \\ u^3 - au + u^2 - 1 \end{pmatrix}$$

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

$$a_{12} = \begin{pmatrix} u^2a - u^3 + au - u^2 + a + u + 1 \\ u^2a + au - u^2 + u + 1 \end{pmatrix}$$

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

$$a_2 = \begin{pmatrix} u^3 - au + 2u^2 - a \\ -u^3a - u^2a - au + u^2 - u - 1 \end{pmatrix}$$

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

$$a_5 = \begin{pmatrix} 2u^3 + 1 \\ 2u^3 + 2u^2 + 2 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -u^3 \\ -u^3 - u^2 - 1 \end{pmatrix}$$

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

(ii) Obstruction class = -1

(iii) Cusp Shapes =  $4u^2 + 4u - 10$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
$c_1$	$u^8 + 13u^7 + \cdots + 889u + 256$
$c_2, c_5, c_6$ $c_{11}, c_{12}$	$u^8 + u^7 - 6u^6 - 4u^5 + 21u^4 + 11u^3 - 27u^2 - 5u + 16$
$c_3, c_9$	$(u^4 + u^3 + u^2 + 1)^2$
$c_4$	$(u^4 - 5u^3 + 7u^2 - 2u + 1)^2$
$c_7$	$(u^4 + u^3 + 3u^2 + 2u + 1)^2$
$c_8, c_{10}$	$(u^4 - u^3 + 3u^2 - 2u + 1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
$c_1$	$y^8 + 3y^7 + \dots - 16689y + 65536$
$c_2, c_5, c_6$ $c_{11}, c_{12}$	$y^8 - 13y^7 + \dots - 889y + 256$
$c_3, c_9$	$(y^4 + y^3 + 3y^2 + 2y + 1)^2$
$c_4$	$(y^4 - 11y^3 + 31y^2 + 10y + 1)^2$
$c_7, c_8, c_{10}$	$(y^4 + 5y^3 + 7y^2 + 2y + 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to $I_3^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.351808 + 0.720342I$ $a = -0.560363 + 0.369379I$ $b = -1.43601 + 0.67423I$	$-3.07886 - 1.41510I$	$-10.17326 + 4.90874I$
$u = 0.351808 + 0.720342I$ $a = -0.03038 + 1.97868I$ $b = -0.463219 - 0.273703I$	$-3.07886 - 1.41510I$	$-10.17326 + 4.90874I$
$u = 0.351808 - 0.720342I$ $a = -0.560363 - 0.369379I$ $b = -1.43601 - 0.67423I$	$-3.07886 + 1.41510I$	$-10.17326 - 4.90874I$
$u = 0.351808 - 0.720342I$ $a = -0.03038 - 1.97868I$ $b = -0.463219 + 0.273703I$	$-3.07886 + 1.41510I$	$-10.17326 - 4.90874I$
$u = -0.851808 + 0.911292I$ $a = 1.15548 - 1.61606I$ $b = -0.08923 - 2.75519I$	$-10.08060 + 3.16396I$	$-13.82674 - 2.56480I$
$u = -0.851808 + 0.911292I$ $a = -1.56474 + 1.56051I$ $b = 0.48846 + 2.42955I$	$-10.08060 + 3.16396I$	$-13.82674 - 2.56480I$
$u = -0.851808 - 0.911292I$ $a = 1.15548 + 1.61606I$ $b = -0.08923 + 2.75519I$	$-10.08060 - 3.16396I$	$-13.82674 + 2.56480I$
$u = -0.851808 - 0.911292I$ $a = -1.56474 - 1.56051I$ $b = 0.48846 - 2.42955I$	$-10.08060 - 3.16396I$	$-13.82674 + 2.56480I$

$$\text{IV. } I_4^u = \langle -u^3 - u^2 + b + 1, -u^3 - u^2 + a - u, u^4 + 1 \rangle$$

(i) Arc colorings

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

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

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

$$a_6 = \begin{pmatrix} u^3 + u^2 + u \\ u^3 + u^2 - 1 \end{pmatrix}$$

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

$$a_{12} = \begin{pmatrix} -u^3 - u + 1 \\ -u^3 + 1 \end{pmatrix}$$

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

$$a_2 = \begin{pmatrix} -u^3 - u^2 \\ -u^2 + u + 1 \end{pmatrix}$$

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

$$a_5 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} u^2 \\ -1 \end{pmatrix}$$

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

(ii) Obstruction class = 1

(iii) Cusp Shapes = -16

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
$c_1, c_2, c_6$	$(u - 1)^4$
$c_3, c_4, c_7$ $c_9$	$u^4 + 1$
$c_5, c_{11}, c_{12}$	$(u + 1)^4$
$c_8, c_{10}$	$(u^2 + 1)^2$



(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
$c_1, c_2, c_5$ $c_6, c_{11}, c_{12}$	$(y - 1)^4$
$c_3, c_4, c_7$ $c_9$	$(y^2 + 1)^2$
$c_8, c_{10}$	$(y + 1)^4$

(vi) Complex Volumes and Cusp Shapes

Solutions to $I_4^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.707107 + 0.707107I$		
$a = 2.41421I$	-4.93480	-16.0000
$b = -1.70711 + 1.70711I$		
$u = 0.707107 - 0.707107I$		
$a = -2.41421I$	-4.93480	-16.0000
$b = -1.70711 - 1.70711I$		
$u = -0.707107 + 0.707107I$		
$a = 0.414214I$	-4.93480	-16.0000
$b = -0.292893 - 0.292893I$		
$u = -0.707107 - 0.707107I$		
$a = -0.414214I$	-4.93480	-16.0000
$b = -0.292893 + 0.292893I$		

$$\mathbf{V. } I_5^u = \langle b - u, a - 1, u^2 + 1 \rangle$$

**(i) Arc colorings**

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

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

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

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

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

$$a_{12} = \begin{pmatrix} 1 \\ u - 1 \end{pmatrix}$$

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

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

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

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

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

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

**(ii) Obstruction class = 1**

**(iii) Cusp Shapes = -8**

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
$c_1, c_5, c_{10}$ $c_{11}, c_{12}$	$(u - 1)^2$
$c_2, c_6, c_8$	$(u + 1)^2$
$c_3, c_4, c_7$ $c_9$	$u^2 + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
$c_1, c_2, c_5$ $c_6, c_8, c_{10}$ $c_{11}, c_{12}$	$(y - 1)^2$
$c_3, c_4, c_7$ $c_9$	$(y + 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to $I_5^u$		$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u =$	$1.000000I$	0	-8.00000
$a =$	1.00000		
$b =$	$1.000000I$		
$u =$	$-1.000000I$	0	-8.00000
$a =$	1.00000		
$b =$	$-1.000000I$		

$$\text{VI. } I_1^v = \langle a, b + 1, v + 1 \rangle$$

(i) Arc colorings

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

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

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

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

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

$$a_{12} = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$

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

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

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

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

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

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

(ii) Obstruction class = 1

(iii) Cusp Shapes = -12

(iv) **u**-Polynomials at the component

Crossings	<b>u</b> -Polynomials at each crossing
$c_1, c_2, c_6$	$u - 1$
$c_3, c_4, c_7$ $c_8, c_9, c_{10}$	$u$
$c_5, c_{11}, c_{12}$	$u + 1$



(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
$c_1, c_2, c_5$ $c_6, c_{11}, c_{12}$	$y - 1$
$c_3, c_4, c_7$ $c_8, c_9, c_{10}$	$y$

(vi) Complex Volumes and Cusp Shapes

Solutions to $I_1^v$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$v = -1.00000$		
$a = 0$	$-3.28987$	$-12.0000$
$b = -1.00000$		

## VII. u-Polynomials

Crossings	u-Polynomials at each crossing
$c_1$	$((u-1)^{11})(u^8 + 13u^7 + \dots + 889u + 256)(u^{16} + 31u^{15} + \dots + 18u + 1)$
$c_2, c_6$	$((u-1)^5)(u+1)^6(u^8 + u^7 + \dots - 5u + 16)$ $\cdot (u^{16} + u^{15} + \dots + 9u^2 - 1)$
$c_3, c_9$	$u(u^2 + 1)(u^4 + 1)(u^4 + u^2 + 2)(u^4 + u^3 + u^2 + 1)^2(u^{16} - 3u^{15} + \dots + 2u + 2)$
$c_4$	$u(u^2 + 1)(u^4 + 1)(u^4 + u^2 + 2)(u^4 - 5u^3 + 7u^2 - 2u + 1)^2$ $\cdot (u^{16} + 15u^{15} + \dots + 1866u + 314)$
$c_5, c_{11}, c_{12}$	$((u-1)^6)(u+1)^5(u^8 + u^7 + \dots - 5u + 16)$ $\cdot (u^{16} + u^{15} + \dots + 9u^2 - 1)$
$c_7$	$u(u^2 + 1)(u^4 + 1)(u^4 + u^2 + 2)(u^4 + u^3 + 3u^2 + 2u + 1)^2$ $\cdot (u^{16} - 3u^{15} + \dots + 110u + 50)$
$c_8$	$u(u+1)^2(u^2 + 1)^2(u^2 + u + 2)^2(u^4 - u^3 + 3u^2 - 2u + 1)^2$ $\cdot (u^{16} - 5u^{15} + \dots + 20u + 4)$
$c_{10}$	$u(u-1)^2(u^2 + 1)^2(u^2 - u + 2)^2(u^4 - u^3 + 3u^2 - 2u + 1)^2$ $\cdot (u^{16} - 5u^{15} + \dots + 20u + 4)$

### VIII. Riley Polynomials

Crossings	Riley Polynomials at each crossing
$c_1$	$((y-1)^{11})(y^8 + 3y^7 + \dots - 16689y + 65536)$ $\cdot (y^{16} - 119y^{15} + \dots - 66y + 1)$
$c_2, c_5, c_6$ $c_{11}, c_{12}$	$((y-1)^{11})(y^8 - 13y^7 + \dots - 889y + 256)(y^{16} - 31y^{15} + \dots - 18y + 1)$
$c_3, c_9$	$y(y+1)^2(y^2+1)^2(y^2+y+2)^2(y^4+y^3+3y^2+2y+1)^2$ $\cdot (y^{16} + 5y^{15} + \dots - 20y + 4)$
$c_4$	$y(y+1)^2(y^2+1)^2(y^2+y+2)^2(y^4-11y^3+31y^2+10y+1)^2$ $\cdot (y^{16} - 7y^{15} + \dots - 540404y + 98596)$
$c_7$	$y(y+1)^2(y^2+1)^2(y^2+y+2)^2(y^4+5y^3+7y^2+2y+1)^2$ $\cdot (y^{16} - 75y^{15} + \dots + 55500y + 2500)$
$c_8, c_{10}$	$y(y-1)^2(y+1)^4(y^2+3y+4)^2(y^4+5y^3+7y^2+2y+1)^2$ $\cdot (y^{16} + 13y^{15} + \dots - 1008y + 16)$