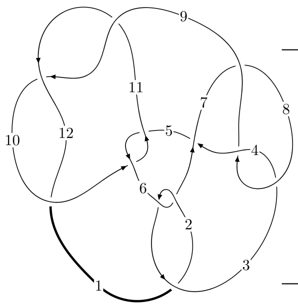
# $12n_{0336}$ $(K12n_{0336})$




A knot diagram[1]

**Linearized knot diagam**

$$\rightarrow\downarrow\rightarrow\uparrow\rightarrow\uparrow\rightarrow\downarrow\rightarrow\downarrow\rightarrow\uparrow\rightarrow\uparrow\rightarrow\uparrow\rightarrow\uparrow\rightarrow\downarrow\rightarrow\uparrow\rightarrow\uparrow\rightarrow$$

3 6 8 7 11 2 9 4 12 6 9 10

**Solving Sequence**

$$9{,}11 \underset{c_{11}}{\rightarrow} 12 \underset{c_{9}}{\rightarrow} 10 \underset{c_{12}}{\rightarrow} 1{,}4 \underset{c_{8}}{\rightarrow} 8 \underset{c_{3}}{\longrightarrow} 3 \underset{c_{7}}{\longrightarrow} 7 \underset{c_{4}}{\longrightarrow} 5 \underset{c_{5}}{\longrightarrow} 6 \underset{c_{2}}{\longrightarrow} 2 \twoheadrightarrow c_1, c_6, c_{10}$$

**Ideals for irreducible components[2] of $X_{\mathbf{par}}$**

$$\begin{aligned}
I_1^u = \langle &-1706550177091u^{18} - 23512487300441u^{17} + \cdots + 39336273597696b - 69157159108721,\\
&-32608816754461u^{18} - 456051534293894u^{17} + \cdots + 19668136798848a - 1093408920959144,\\
&u^{19} + 14u^{18} + \cdots + 52u + 1\rangle\\
I_2^u = \langle &-a^8 + a^7 + 3a^6 - 2a^5 - 3a^4 + 2a^3 + b + a + 2,\ a^9 - a^8 - 2a^7 + 3a^6 + a^5 - 3a^4 + 2a^3 - a + 1,\ u - 1\rangle\\
I_3^u = \langle &-3a^3u + 2a^3 - a^2u + b + a,\ a^4 - a^2u - 2a^2 + 3u + 5,\ u^2 + u - 1\rangle
\end{aligned}$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 36 representations.

[1] 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`).

[2] All coefficients of polynomials are rational numbers. But the coefficients are sometimes approximated in decimal forms when there is not enough margin.

**I. $I^u_1 = \langle -1.71 \times 10^{12}u^{18} - 2.35 \times 10^{13}u^{17} + \cdots + 3.93 \times 10^{13}b - 6.92 \times 10^{13},\ -3.26 \times 10^{13}u^{18} - 4.56 \times 10^{14}u^{17} + \cdots + 1.97 \times 10^{13}a - 1.09 \times 10^{15},\ u^{19} + 14u^{18} + \cdots + 52u + 1\rangle$**

**(i) Arc colorings**

$$a_9 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u \\ -u^3 + u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^2 + 1 \\ u^4 - 2u^2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 1.65795u^{18} + 23.1873u^{17} + \cdots + 1589.07u + 55.5929 \\ 0.0433836u^{18} + 0.597730u^{17} + \cdots + 39.8060u + 1.75810 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 1.84251u^{18} + 25.7334u^{17} + \cdots + 1669.72u + 43.2886 \\ 0.0542335u^{18} + 0.767279u^{17} + \cdots + 55.0156u + 1.70577 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 0.243745u^{18} + 3.43967u^{17} + \cdots + 332.641u + 35.7067 \\ -0.0193717u^{18} - 0.267431u^{17} + \cdots - 10.7266u + 0.631068 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1.84251u^{18} + 25.7334u^{17} + \cdots + 1669.72u + 43.2886 \\ 0.0598519u^{18} + 0.839590u^{17} + \cdots + 56.3822u + 1.76749 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0.0513825u^{18} + 0.731152u^{17} + \cdots + 83.7307u + 7.87385 \\ -0.00184480u^{18} - 0.0331746u^{17} + \cdots - 3.98487u + 0.0723727 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0.0532273u^{18} + 0.764327u^{17} + \cdots + 87.7156u + 7.80147 \\ -0.00184480u^{18} - 0.0331746u^{17} + \cdots - 3.98487u + 0.0723727 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -0.136733u^{18} - 1.87566u^{17} + \cdots - 19.9103u + 26.8869 \\ -0.0281326u^{18} - 0.392506u^{17} + \cdots - 21.4809u + 0.261960 \end{pmatrix}$$

**(ii) Obstruction class** $= -1$

**(iii) Cusp Shapes**
$= -\frac{390713901803}{1639011399904}u^{18} - \frac{21917006139285}{6556045599616}u^{17} + \cdots - \frac{430703611764529}{1639011399904}u - \frac{74684759366323}{6556045599616}$

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

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1$ | $u^{19} - 9u^{18} + \cdots + 9432u - 1296$ |
| $c_2, c_6$ | $u^{19} - 7u^{18} + \cdots - 36u + 36$ |
| $c_3, c_8$ | $u^{19} - 2u^{18} + \cdots - 12u + 9$ |
| $c_4$ | $u^{19} - 6u^{18} + \cdots + 19710u - 2349$ |
| $c_5, c_{10}$ | $u^{19} + u^{18} + \cdots + 1536u + 512$ |
| $c_7$ | $u^{19} - 16u^{18} + \cdots + 540u - 81$ |
| $c_9, c_{11}, c_{12}$ | $u^{19} + 14u^{18} + \cdots + 52u + 1$ |

**(v) Riley Polynomials at the component**

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1$ | $y^{19} - y^{18} + \cdots + 159068448y - 1679616$ |
| $c_2, c_6$ | $y^{19} - 9y^{18} + \cdots + 9432y - 1296$ |
| $c_3, c_8$ | $y^{19} - 16y^{18} + \cdots + 540y - 81$ |
| $c_4$ | $y^{19} + 56y^{18} + \cdots + 419265396y - 5517801$ |
| $c_5, c_{10}$ | $y^{19} + 69y^{18} + \cdots + 15204352y - 262144$ |
| $c_7$ | $y^{19} - 20y^{18} + \cdots + 220968y - 6561$ |
| $c_9, c_{11}, c_{12}$ | $y^{19} - 72y^{18} + \cdots + 696y - 1$ |

**(vi) Complex Volumes and Cusp Shapes**

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 1.090810 + 0.087492I$<br>$a = 0.864947 + 0.453435I$<br>$b = 1.25966 - 4.27188I$ | $0.12746 + 2.07953I$ | $0.79710 + 6.78619I$ |
| $u = 1.090810 - 0.087492I$<br>$a = 0.864947 - 0.453435I$<br>$b = 1.25966 + 4.27188I$ | $0.12746 - 2.07953I$ | $0.79710 - 6.78619I$ |
| $u = 1.12421$<br>$a = -0.369206$<br>$b = -0.262337$ | $2.16627$ | $2.38650$ |
| $u = -0.866404 + 0.903603I$<br>$a = 0.403452 + 1.041090I$<br>$b = -1.260210 - 0.033364I$ | $4.84224 + 5.75329I$ | $6.23581 - 2.60069I$ |
| $u = -0.866404 - 0.903603I$<br>$a = 0.403452 - 1.041090I$<br>$b = -1.260210 + 0.033364I$ | $4.84224 - 5.75329I$ | $6.23581 + 2.60069I$ |
| $u = 0.264112 + 0.511238I$<br>$a = 0.998671 + 0.095546I$<br>$b = 0.655201 - 0.830329I$ | $0.335625 + 1.223470I$ | $4.13138 - 4.81848I$ |
| $u = 0.264112 - 0.511238I$<br>$a = 0.998671 - 0.095546I$<br>$b = 0.655201 + 0.830329I$ | $0.335625 - 1.223470I$ | $4.13138 + 4.81848I$ |
| $u = -1.54015 + 0.03306I$<br>$a = -0.616311 + 0.224492I$<br>$b = 0.39526 - 1.71073I$ | $8.24788 - 1.49342I$ | $14.3201 - 0.4966I$ |
| $u = -1.54015 - 0.03306I$<br>$a = -0.616311 - 0.224492I$<br>$b = 0.39526 + 1.71073I$ | $8.24788 + 1.49342I$ | $14.3201 + 0.4966I$ |
| $u = -0.272498$<br>$a = -3.42293$<br>$b = -0.561462$ | $1.52167$ | $5.90680$ |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = -0.0292040 + 0.0188465I$<br>$a = 11.6667 + 24.4338I$<br>$b = 0.653657 + 0.621796I$ | $-1.74489 + 2.05954I$ | $-4.07768 - 4.15264I$ |
| $u = -0.0292040 - 0.0188465I$<br>$a = 11.6667 - 24.4338I$<br>$b = 0.653657 - 0.621796I$ | $-1.74489 - 2.05954I$ | $-4.07768 + 4.15264I$ |
| $u = -2.00138 + 0.76457I$<br>$a = -0.689796 + 0.112485I$<br>$b = -0.56693 - 3.57760I$ | $-15.5608 - 12.7812I$ | $6.72063 + 5.11794I$ |
| $u = -2.00138 - 0.76457I$<br>$a = -0.689796 - 0.112485I$<br>$b = -0.56693 + 3.57760I$ | $-15.5608 + 12.7812I$ | $6.72063 - 5.11794I$ |
| $u = -2.42283 + 0.72006I$<br>$a = 0.017324 - 0.538247I$<br>$b = 2.30004 + 3.34538I$ | $-18.5440 - 5.6494I$ | $4.00000 + 0.I$ |
| $u = -2.42283 - 0.72006I$<br>$a = 0.017324 + 0.538247I$<br>$b = 2.30004 - 3.34538I$ | $-18.5440 + 5.6494I$ | $4.00000 + 0.I$ |
| $u = -3.92517 + 0.42402I$<br>$a = 0.495462 - 0.122568I$<br>$b = -4.38040 + 4.23334I$ | $-11.60890 - 1.83503I$ | 0 |
| $u = -3.92517 - 0.42402I$<br>$a = 0.495462 + 0.122568I$<br>$b = -4.38040 - 4.23334I$ | $-11.60890 + 1.83503I$ | 0 |
| $u = 4.00873$<br>$a = 0.511273$<br>$b = -5.28877$ | 11.4850 | 0 |

**II.** $\boldsymbol{I_2^u = \langle -a^8 + a^7 + 3a^6 - 2a^5 - 3a^4 + 2a^3 + b + a + 2,\ a^9 - a^8 - 2a^7 + 3a^6 + a^5 - 3a^4 + 2a^3 - a + 1,\ u - 1\rangle}$

**(i) Arc colorings**

$$a_9 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 1 \\ -1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} a \\ a^8 - a^7 - 3a^6 + 2a^5 + 3a^4 - 2a^3 - a - 2 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -a^2 \\ a^7 + a^6 - 2a^5 - a^4 + 2a^3 + a^2 + a + 2 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -a^3 + a \\ 2a^8 - 5a^6 + a^5 + 5a^4 - a^3 + a^2 + a - 2 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -a^2 \\ a^7 + a^6 - 2a^5 - a^4 + 2a^3 + a + 2 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} a^5 - a^3 + a \\ 0 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} a^5 - a^3 + a \\ 0 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} a^6 - 2a^4 + a^2 \\ 2a^8 - 5a^6 + a^5 + 5a^4 - a^3 + a^2 + a - 2 \end{pmatrix}$$

**(ii) Obstruction class** $= 1$

**(iii) Cusp Shapes** $= 6a^8 - 3a^7 - 10a^6 + 8a^5 + 2a^4 - 8a^3 + 12a^2 + 6$

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

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1, c_4$ | $u^9 - 3u^8 + 8u^7 - 13u^6 + 17u^5 - 17u^4 + 12u^3 - 6u^2 + u + 1$ |
| $c_2$ | $u^9 - u^8 + 2u^7 - u^6 + 3u^5 - u^4 + 2u^3 + u + 1$ |
| $c_3$ | $u^9 - u^8 - 2u^7 + 3u^6 + u^5 - 3u^4 + 2u^3 - u + 1$ |
| $c_5, c_{10}$ | $u^9$ |
| $c_6$ | $u^9 + u^8 + 2u^7 + u^6 + 3u^5 + u^4 + 2u^3 + u - 1$ |
| $c_7$ | $u^9 + 5u^8 + 12u^7 + 15u^6 + 9u^5 - u^4 - 4u^3 - 2u^2 + u + 1$ |
| $c_8$ | $u^9 + u^8 - 2u^7 - 3u^6 + u^5 + 3u^4 + 2u^3 - u - 1$ |
| $c_9$ | $(u+1)^9$ |
| $c_{11}, c_{12}$ | $(u-1)^9$ |

**(v) Riley Polynomials at the component**

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1, c_4$ | $y^9 + 7y^8 + 20y^7 + 25y^6 + 5y^5 - 15y^4 + 22y^2 + 13y - 1$ |
| $c_2, c_6$ | $y^9 + 3y^8 + 8y^7 + 13y^6 + 17y^5 + 17y^4 + 12y^3 + 6y^2 + y - 1$ |
| $c_3, c_8$ | $y^9 - 5y^8 + 12y^7 - 15y^6 + 9y^5 + y^4 - 4y^3 + 2y^2 + y - 1$ |
| $c_5, c_{10}$ | $y^9$ |
| $c_7$ | $y^9 - y^8 + 12y^7 - 7y^6 + 37y^5 + y^4 - 10y^2 + 5y - 1$ |
| $c_9, c_{11}, c_{12}$ | $(y-1)^9$ |

**(vi) Complex Volumes and Cusp Shapes**

| Solutions to $I_2^u$ | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 1.00000$<br>$a = 0.772920 + 0.510351I$<br>$b = -3.25219 + 0.42284I$ | $-0.13850 + 2.09337I$ | $11.64247 + 5.88316I$ |
| $u = 1.00000$<br>$a = 0.772920 - 0.510351I$<br>$b = -3.25219 - 0.42284I$ | $-0.13850 - 2.09337I$ | $11.64247 - 5.88316I$ |
| $u = 1.00000$<br>$a = -0.825933$<br>$b = 0.106533$ | $2.84338$ | $15.4610$ |
| $u = 1.00000$<br>$a = -1.173910 + 0.391555I$<br>$b = -0.121911 - 0.782086I$ | $6.01628 - 1.33617I$ | $7.94914 + 0.75351I$ |
| $u = 1.00000$<br>$a = -1.173910 - 0.391555I$<br>$b = -0.121911 + 0.782086I$ | $6.01628 + 1.33617I$ | $7.94914 - 0.75351I$ |
| $u = 1.00000$<br>$a = 0.141484 + 0.739668I$<br>$b = -0.217279 - 0.962736I$ | $2.26187 - 2.45442I$ | $4.75622 + 3.91612I$ |
| $u = 1.00000$<br>$a = 0.141484 - 0.739668I$<br>$b = -0.217279 + 0.962736I$ | $2.26187 + 2.45442I$ | $4.75622 - 3.91612I$ |
| $u = 1.00000$<br>$a = 1.172470 + 0.500383I$<br>$b = 0.038112 - 1.195250I$ | $5.24306 + 7.08493I$ | $7.92182 - 8.89461I$ |
| $u = 1.00000$<br>$a = 1.172470 - 0.500383I$<br>$b = 0.038112 + 1.195250I$ | $5.24306 - 7.08493I$ | $7.92182 + 8.89461I$ |

**III.** $\boldsymbol{I_3^u = \langle -3a^3u + 2a^3 - a^2u + b + a,\ a^4 - a^2u - 2a^2 + 3u + 5,\ u^2 + u - 1\rangle}$

**(i) Arc colorings**

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

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

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

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

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

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

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

$$a_3 = \begin{pmatrix} a^3u - a^3 + a \\ -a^3u + a^3 - a + u + 1 \end{pmatrix}$$

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

$$a_5 = \begin{pmatrix} 0 \\ 3a^3u - 2a^3 \end{pmatrix}$$

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

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

**(ii) Obstruction class** $= 1$

**(iii) Cusp Shapes** $= 4a^2u - 4a^2 + 8$

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

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1$ | $(u-1)^8$ |
| $c_2, c_6$ | $(u^2+1)^4$ |
| $c_3, c_4, c_8$ | $(u^4-u^2+1)^2$ |
| $c_5, c_{10}$ | $(u^4+3u^2+1)^2$ |
| $c_7$ | $(u^2+u+1)^4$ |
| $c_9$ | $(u^2-u-1)^4$ |
| $c_{11}, c_{12}$ | $(u^2+u-1)^4$ |

**(v) Riley Polynomials at the component**

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1$ | $(y-1)^8$ |
| $c_2, c_6$ | $(y+1)^8$ |
| $c_3, c_4, c_8$ | $(y^2-y+1)^4$ |
| $c_5, c_{10}$ | $(y^2+3y+1)^4$ |
| $c_7$ | $(y^2+y+1)^4$ |
| $c_9, c_{11}, c_{12}$ | $(y^2-3y+1)^4$ |

**(vi) Complex Volumes and Cusp Shapes**

| Solutions to $I_3^u$ | $\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 0.618034$<br>$a = 1.40126 + 0.80902I$<br>$b = -0.592242 - 0.025792I$ | $-0.65797 + 2.02988I$ | $6.00000 - 3.46410I$ |
| $u = 0.618034$<br>$a = 1.40126 - 0.80902I$<br>$b = -0.592242 + 0.025792I$ | $-0.65797 - 2.02988I$ | $6.00000 + 3.46410I$ |
| $u = 0.618034$<br>$a = -1.40126 + 0.80902I$<br>$b = 2.21028 - 2.82831I$ | $-0.65797 - 2.02988I$ | $6.00000 + 3.46410I$ |
| $u = 0.618034$<br>$a = -1.40126 - 0.80902I$<br>$b = 2.21028 + 2.82831I$ | $-0.65797 + 2.02988I$ | $6.00000 - 3.46410I$ |
| $u = -1.61803$<br>$a = -0.535233 + 0.309017I$<br>$b = 0.226216 - 1.391820I$ | $7.23771 + 2.02988I$ | $6.00000 - 3.46410I$ |
| $u = -1.61803$<br>$a = -0.535233 - 0.309017I$<br>$b = 0.226216 + 1.391820I$ | $7.23771 - 2.02988I$ | $6.00000 + 3.46410I$ |
| $u = -1.61803$<br>$a = 0.535233 + 0.309017I$<br>$b = -0.84425 - 2.46228I$ | $7.23771 - 2.02988I$ | $6.00000 + 3.46410I$ |
| $u = -1.61803$<br>$a = 0.535233 - 0.309017I$<br>$b = -0.84425 + 2.46228I$ | $7.23771 + 2.02988I$ | $6.00000 - 3.46410I$ |

**IV. u-Polynomials**

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1$ | $((u-1)^8)(u^9-3u^8+\cdots+u+1)$ <br> $\cdot(u^{19}-9u^{18}+\cdots+9432u-1296)$ |
| $c_2$ | $(u^2+1)^4(u^9-u^8+2u^7-u^6+3u^5-u^4+2u^3+u+1)$ <br> $\cdot(u^{19}-7u^{18}+\cdots-36u+36)$ |
| $c_3$ | $(u^4-u^2+1)^2(u^9-u^8-2u^7+3u^6+u^5-3u^4+2u^3-u+1)$ <br> $\cdot(u^{19}-2u^{18}+\cdots-12u+9)$ |
| $c_4$ | $(u^4-u^2+1)^2$ <br> $\cdot(u^9-3u^8+8u^7-13u^6+17u^5-17u^4+12u^3-6u^2+u+1)$ <br> $\cdot(u^{19}-6u^{18}+\cdots+19710u-2349)$ |
| $c_5, c_{10}$ | $u^9(u^4+3u^2+1)^2(u^{19}+u^{18}+\cdots+1536u+512)$ |
| $c_6$ | $(u^2+1)^4(u^9+u^8+2u^7+u^6+3u^5+u^4+2u^3+u-1)$ <br> $\cdot(u^{19}-7u^{18}+\cdots-36u+36)$ |
| $c_7$ | $((u^2+u+1)^4)(u^9+5u^8+\cdots+u+1)$ <br> $\cdot(u^{19}-16u^{18}+\cdots+540u-81)$ |
| $c_8$ | $(u^4-u^2+1)^2(u^9+u^8-2u^7-3u^6+u^5+3u^4+2u^3-u-1)$ <br> $\cdot(u^{19}-2u^{18}+\cdots-12u+9)$ |
| $c_9$ | $((u+1)^9)(u^2-u-1)^4(u^{19}+14u^{18}+\cdots+52u+1)$ |
| $c_{11}, c_{12}$ | $((u-1)^9)(u^2+u-1)^4(u^{19}+14u^{18}+\cdots+52u+1)$ |

## V. Riley Polynomials

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1$ | $(y-1)^8(y^9+7y^8+20y^7+25y^6+5y^5-15y^4+22y^2+13y-1)$<br>$\cdot(y^{19}-y^{18}+\cdots+159068448y-1679616)$ |
| $c_2, c_6$ | $((y+1)^8)(y^9+3y^8+\cdots+y-1)$<br>$\cdot(y^{19}-9y^{18}+\cdots+9432y-1296)$ |
| $c_3, c_8$ | $((y^2-y+1)^4)(y^9-5y^8+\cdots+y-1)$<br>$\cdot(y^{19}-16y^{18}+\cdots+540y-81)$ |
| $c_4$ | $((y^2-y+1)^4)(y^9+7y^8+\cdots+13y-1)$<br>$\cdot(y^{19}+56y^{18}+\cdots+419265396y-5517801)$ |
| $c_5, c_{10}$ | $y^9(y^2+3y+1)^4(y^{19}+69y^{18}+\cdots+1.52044\times10^7y-262144)$ |
| $c_7$ | $(y^2+y+1)^4(y^9-y^8+12y^7-7y^6+37y^5+y^4-10y^2+5y-1)$<br>$\cdot(y^{19}-20y^{18}+\cdots+220968y-6561)$ |
| $c_9, c_{11}, c_{12}$ | $((y-1)^9)(y^2-3y+1)^4(y^{19}-72y^{18}+\cdots+696y-1)$ |