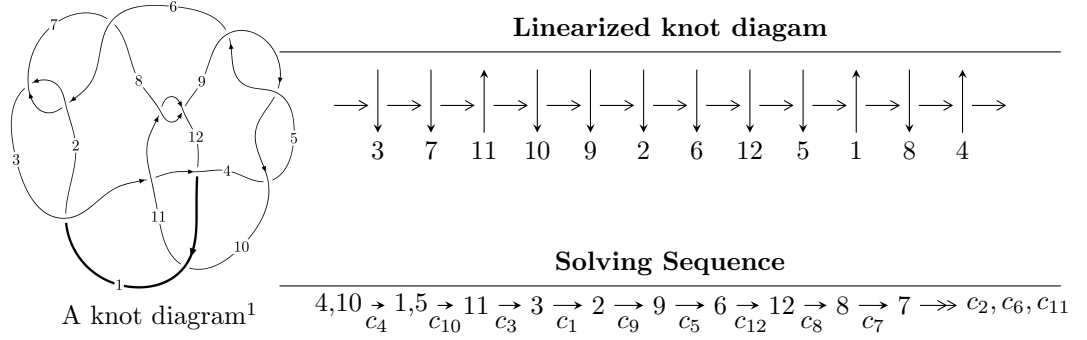


12a₀₆₇₇ (K12a₀₆₇₇)



Ideals for irreducible components² of X_{par}

$$I_1^u = \langle -1.64622 \times 10^{208} u^{95} - 1.80313 \times 10^{208} u^{94} + \dots + 1.14976 \times 10^{209} b + 3.29451 \times 10^{209}, \\ -1.64003 \times 10^{210} u^{95} - 3.12587 \times 10^{210} u^{94} + \dots + 1.14976 \times 10^{209} a + 1.12635 \times 10^{211}, \\ u^{96} + 2u^{95} + \dots - 44u - 1 \rangle$$

$$I_2^u = \langle -u^{23} + u^{22} + \dots + b + 1, u^{23} - u^{22} + \dots + a - 2u, u^{24} - u^{23} + \dots - 2u - 1 \rangle$$

$$I_3^u = \langle b - u, a - u, u^{15} + 3u^{13} + u^{10} - 5u^9 + 2u^8 - u^6 + 5u^5 - 2u^4 + u^3 + u^2 - 2u + 1 \rangle$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 135 representations.

¹The 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>).

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

$$\text{I. } I_1^u = \langle -1.65 \times 10^{208} u^{95} - 1.80 \times 10^{208} u^{94} + \dots + 1.15 \times 10^{209} b + 3.29 \times 10^{209}, -1.64 \times 10^{210} u^{95} - 3.13 \times 10^{210} u^{94} + \dots + 1.15 \times 10^{209} a + 1.13 \times 10^{211}, u^{96} + 2u^{95} + \dots - 44u - 1 \rangle$$

(i) Arc colorings

$$\begin{aligned} a_4 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_{10} &= \begin{pmatrix} 0 \\ u \end{pmatrix} \\ a_1 &= \begin{pmatrix} 14.2640u^{95} + 27.1870u^{94} + \dots - 4367.63u - 97.9634 \\ 0.143179u^{95} + 0.156826u^{94} + \dots - 29.3497u - 2.86538 \end{pmatrix} \\ a_5 &= \begin{pmatrix} 1 \\ u^2 \end{pmatrix} \\ a_{11} &= \begin{pmatrix} -20.9593u^{95} - 40.0137u^{94} + \dots + 6954.20u + 166.245 \\ -1.49859u^{95} - 2.89068u^{94} + \dots + 755.253u + 25.2178 \end{pmatrix} \\ a_3 &= \begin{pmatrix} 47.3979u^{95} + 92.0448u^{94} + \dots - 21779.0u - 745.556 \\ -1.33998u^{95} - 2.62161u^{94} + \dots + 518.832u + 13.9434 \end{pmatrix} \\ a_2 &= \begin{pmatrix} -35.1741u^{95} - 67.7608u^{94} + \dots + 14192.6u + 430.358 \\ -1.10655u^{95} - 2.18893u^{94} + \dots + 557.402u + 19.3210 \end{pmatrix} \\ a_9 &= \begin{pmatrix} u \\ u^3 + u \end{pmatrix} \\ a_6 &= \begin{pmatrix} u^2 + 1 \\ u^4 + 2u^2 \end{pmatrix} \\ a_{12} &= \begin{pmatrix} 14.1209u^{95} + 27.0302u^{94} + \dots - 4338.28u - 95.0980 \\ 0.143179u^{95} + 0.156826u^{94} + \dots - 29.3497u - 2.86538 \end{pmatrix} \\ a_8 &= \begin{pmatrix} -15.0602u^{95} - 28.4628u^{94} + \dots + 4595.10u + 87.8304 \\ -2.43281u^{95} - 4.66738u^{94} + \dots + 912.262u + 29.7776 \end{pmatrix} \\ a_7 &= \begin{pmatrix} -17.2106u^{95} - 32.6434u^{94} + \dots + 5403.52u + 114.640 \\ -2.47071u^{95} - 4.78095u^{94} + \dots + 921.828u + 30.0823 \end{pmatrix} \end{aligned}$$

(ii) Obstruction class = -1

$$\text{(iii) Cusp Shapes} = -21.7341u^{95} - 41.6313u^{94} + \dots + 7622.14u + 212.868$$

(iv) u-Polynomials at the component

| Crossings | u-Polynomials at each crossing |
|-----------------|--------------------------------------------|
| c_1, c_7 | $u^{96} + 30u^{95} + \dots + 7436u + 784$ |
| c_2, c_6 | $u^{96} + 4u^{95} + \dots - 18u + 28$ |
| c_3 | $u^{96} - 4u^{94} + \dots + 4071u + 689$ |
| c_4, c_5, c_9 | $u^{96} - 2u^{95} + \dots + 44u - 1$ |
| c_8, c_{11} | $u^{96} + 5u^{95} + \dots - 5u - 1$ |
| c_{10} | $u^{96} + 5u^{95} + \dots - 81964u - 2147$ |
| c_{12} | $u^{96} + 10u^{95} + \dots + 15u + 919$ |

(v) Riley Polynomials at the component

| Crossings | Riley Polynomials at each crossing |
|-----------------|-----------------------------------------------------|
| c_1, c_7 | $y^{96} + 78y^{95} + \dots - 16700912y + 614656$ |
| c_2, c_6 | $y^{96} - 30y^{95} + \dots - 7436y + 784$ |
| c_3 | $y^{96} - 8y^{95} + \dots - 8914117y + 474721$ |
| c_4, c_5, c_9 | $y^{96} + 108y^{95} + \dots - 430y + 1$ |
| c_8, c_{11} | $y^{96} - 43y^{95} + \dots + 43y + 1$ |
| c_{10} | $y^{96} - 31y^{95} + \dots - 3936130634y + 4609609$ |
| c_{12} | $y^{96} - 26y^{95} + \dots - 25910511y + 844561$ |

(vi) Complex Volumes and Cusp Shapes

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|-----------------------------|---------------------------------------|------------|
| $u = -0.642382 + 0.747532I$ | | |
| $a = 0.795130 + 0.138344I$ | $-3.94945 - 2.66517I$ | 0 |
| $b = 0.472640 - 0.665485I$ | | |
| $u = -0.642382 - 0.747532I$ | | |
| $a = 0.795130 - 0.138344I$ | $-3.94945 + 2.66517I$ | 0 |
| $b = 0.472640 + 0.665485I$ | | |
| $u = -0.163407 + 0.924545I$ | | |
| $a = 0.261179 + 0.268168I$ | $-3.14695 + 1.92811I$ | 0 |
| $b = 0.234294 - 1.199490I$ | | |
| $u = -0.163407 - 0.924545I$ | | |
| $a = 0.261179 - 0.268168I$ | $-3.14695 - 1.92811I$ | 0 |
| $b = 0.234294 + 1.199490I$ | | |
| $u = 0.903619 + 0.565295I$ | | |
| $a = -0.535787 + 1.141530I$ | $2.89024 - 7.03208I$ | 0 |
| $b = -0.914191 + 0.864733I$ | | |
| $u = 0.903619 - 0.565295I$ | | |
| $a = -0.535787 - 1.141530I$ | $2.89024 + 7.03208I$ | 0 |
| $b = -0.914191 - 0.864733I$ | | |
| $u = -0.929020 + 0.527048I$ | | |
| $a = 0.562011 + 1.179470I$ | $2.02889 + 13.17570I$ | 0 |
| $b = 0.945981 + 0.878213I$ | | |
| $u = -0.929020 - 0.527048I$ | | |
| $a = 0.562011 - 1.179470I$ | $2.02889 - 13.17570I$ | 0 |
| $b = 0.945981 - 0.878213I$ | | |
| $u = 0.181695 + 1.084970I$ | | |
| $a = -0.042512 + 0.852733I$ | $3.00310 - 2.55486I$ | 0 |
| $b = -0.201475 + 0.736437I$ | | |
| $u = 0.181695 - 1.084970I$ | | |
| $a = -0.042512 - 0.852733I$ | $3.00310 + 2.55486I$ | 0 |
| $b = -0.201475 - 0.736437I$ | | |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|-----------------------------|---------------------------------------|------------|
| $u = -0.768749 + 0.447591I$ | | |
| $a = 0.400217 + 1.252690I$ | $-4.77135 + 7.54773I$ | 0 |
| $b = 0.892619 + 0.991735I$ | | |
| $u = -0.768749 - 0.447591I$ | | |
| $a = 0.400217 - 1.252690I$ | $-4.77135 - 7.54773I$ | 0 |
| $b = 0.892619 - 0.991735I$ | | |
| $u = 0.636851 + 0.564667I$ | | |
| $a = -0.293208 + 1.133200I$ | $-1.11717 - 4.17193I$ | 0 |
| $b = -0.756081 + 1.003730I$ | | |
| $u = 0.636851 - 0.564667I$ | | |
| $a = -0.293208 - 1.133200I$ | $-1.11717 + 4.17193I$ | 0 |
| $b = -0.756081 - 1.003730I$ | | |
| $u = 0.514896 + 0.637434I$ | | |
| $a = 0.10064 - 1.85594I$ | $4.69245 - 7.43562I$ | 0 |
| $b = 0.869676 - 0.599743I$ | | |
| $u = 0.514896 - 0.637434I$ | | |
| $a = 0.10064 + 1.85594I$ | $4.69245 + 7.43562I$ | 0 |
| $b = 0.869676 + 0.599743I$ | | |
| $u = 0.973976 + 0.737024I$ | | |
| $a = -0.781407 + 0.114647I$ | $3.19863 + 0.84469I$ | 0 |
| $b = -0.591432 - 0.340680I$ | | |
| $u = 0.973976 - 0.737024I$ | | |
| $a = -0.781407 - 0.114647I$ | $3.19863 - 0.84469I$ | 0 |
| $b = -0.591432 + 0.340680I$ | | |
| $u = -0.428543 + 0.647277I$ | | |
| $a = -0.08274 - 1.90952I$ | $5.20927 + 1.65149I$ | 0 |
| $b = -0.880064 - 0.552500I$ | | |
| $u = -0.428543 - 0.647277I$ | | |
| $a = -0.08274 + 1.90952I$ | $5.20927 - 1.65149I$ | 0 |
| $b = -0.880064 + 0.552500I$ | | |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|------------------------------------------------------------------------------------------|---------------------------------------|------------|
| $u = -0.944349 + 0.798718I$ $a = 0.799480 + 0.115897I$ $b = 0.647671 - 0.386867I$ | $2.65249 - 6.96191I$ | 0 |
| $u = -0.944349 - 0.798718I$ $a = 0.799480 - 0.115897I$ $b = 0.647671 + 0.386867I$ | $2.65249 + 6.96191I$ | 0 |
| $u = -0.236293 + 1.239330I$ $a = 0.494149 - 1.100050I$ $b = -1.130850 - 0.431679I$ | $5.89832 + 1.51423I$ | 0 |
| $u = -0.236293 - 1.239330I$ $a = 0.494149 + 1.100050I$ $b = -1.130850 + 0.431679I$ | $5.89832 - 1.51423I$ | 0 |
| $u = 0.107408 + 1.259190I$ $a = -0.736269 - 0.944443I$ $b = 1.255590 - 0.410171I$ | $5.28379 - 6.49457I$ | 0 |
| $u = 0.107408 - 1.259190I$ $a = -0.736269 + 0.944443I$ $b = 1.255590 + 0.410171I$ | $5.28379 + 6.49457I$ | 0 |
| $u = 0.628395 + 0.382312I$ $a = -1.013710 - 0.101449I$ $b = -0.138801 - 0.519383I$ | $-1.62526 - 0.07913I$ | 0 |
| $u = 0.628395 - 0.382312I$ $a = -1.013710 + 0.101449I$ $b = -0.138801 + 0.519383I$ | $-1.62526 + 0.07913I$ | 0 |
| $u = -0.189595 + 1.329350I$ $a = 1.48599 - 0.27269I$ $b = -0.416741 - 0.346248I$ | $4.55048 + 8.93153I$ | 0 |
| $u = -0.189595 - 1.329350I$ $a = 1.48599 + 0.27269I$ $b = -0.416741 + 0.346248I$ | $4.55048 - 8.93153I$ | 0 |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|-----------------------------|---------------------------------------|-----------------------|
| $u = 0.529746 + 0.385802I$ | | |
| $a = 0.15766 - 1.68350I$ | $-0.93963 - 3.29917I$ | $-6.00000 + 8.60879I$ |
| $b = 0.685056 - 0.550946I$ | | |
| $u = 0.529746 - 0.385802I$ | | |
| $a = 0.15766 + 1.68350I$ | $-0.93963 + 3.29917I$ | $-6.00000 - 8.60879I$ |
| $b = 0.685056 + 0.550946I$ | | |
| $u = 0.639018 + 0.144804I$ | | |
| $a = -0.89248 - 1.72577I$ | $0.619188 - 0.521192I$ | $-6.00000 + 2.76597I$ |
| $b = 0.261326 - 0.732585I$ | | |
| $u = 0.639018 - 0.144804I$ | | |
| $a = -0.89248 + 1.72577I$ | $0.619188 + 0.521192I$ | $-6.00000 - 2.76597I$ |
| $b = 0.261326 + 0.732585I$ | | |
| $u = -0.122241 + 1.347590I$ | | |
| $a = 1.164870 + 0.360161I$ | $-0.04172 + 3.60886I$ | 0 |
| $b = -0.409019 - 0.129946I$ | | |
| $u = -0.122241 - 1.347590I$ | | |
| $a = 1.164870 - 0.360161I$ | $-0.04172 - 3.60886I$ | 0 |
| $b = -0.409019 + 0.129946I$ | | |
| $u = -0.020712 + 1.359000I$ | | |
| $a = 0.507621 + 0.819342I$ | $2.89704 - 2.03726I$ | 0 |
| $b = -0.321798 + 0.162935I$ | | |
| $u = -0.020712 - 1.359000I$ | | |
| $a = 0.507621 - 0.819342I$ | $2.89704 + 2.03726I$ | 0 |
| $b = -0.321798 - 0.162935I$ | | |
| $u = -0.626881 + 0.093618I$ | | |
| $a = 1.13491 - 1.94814I$ | $0.12716 + 6.04936I$ | $-9.84333 - 7.90866I$ |
| $b = -0.206534 - 0.782673I$ | | |
| $u = -0.626881 - 0.093618I$ | | |
| $a = 1.13491 + 1.94814I$ | $0.12716 - 6.04936I$ | $-9.84333 + 7.90866I$ |
| $b = -0.206534 + 0.782673I$ | | |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|-----------------------------------------------------------------------------------------|---------------------------------------|------------------------|
| $u = 0.203006 + 1.353870I$ $a = -1.241370 - 0.414215I$ $b = 0.509372 - 0.379609I$ | $5.31675 - 3.50792I$ | 0 |
| $u = 0.203006 - 1.353870I$ $a = -1.241370 + 0.414215I$ $b = 0.509372 + 0.379609I$ | $5.31675 + 3.50792I$ | 0 |
| $u = -0.476489 + 0.385546I$ $a = 0.114169 + 1.240060I$ $b = 0.81049 + 1.22686I$ | $-4.45427 + 0.50532I$ | $-12.41474 - 5.66405I$ |
| $u = -0.476489 - 0.385546I$ $a = 0.114169 - 1.240060I$ $b = 0.81049 - 1.22686I$ | $-4.45427 - 0.50532I$ | $-12.41474 + 5.66405I$ |
| $u = -0.017518 + 1.391350I$ $a = -0.402070 - 0.496558I$ $b = 1.89370 - 0.86583I$ | $2.01697 + 0.39078I$ | 0 |
| $u = -0.017518 - 1.391350I$ $a = -0.402070 + 0.496558I$ $b = 1.89370 + 0.86583I$ | $2.01697 - 0.39078I$ | 0 |
| $u = 0.605239$ $a = -0.0580286$ $b = 0.280335$ | -0.954720 | -11.9410 |
| $u = -0.07333 + 1.42923I$ $a = 0.422648 - 0.817461I$ $b = -1.34991 - 0.87351I$ | $6.99819 + 2.24677I$ | 0 |
| $u = -0.07333 - 1.42923I$ $a = 0.422648 + 0.817461I$ $b = -1.34991 + 0.87351I$ | $6.99819 - 2.24677I$ | 0 |
| $u = 0.19362 + 1.42570I$ $a = -0.585335 - 0.964116I$ $b = 0.984848 - 0.756326I$ | $4.85639 - 5.95300I$ | 0 |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|----------------------------------------------------------------------------------------|---------------------------------------|------------|
| $u = 0.19362 - 1.42570I$ $a = -0.585335 + 0.964116I$ $b = 0.984848 + 0.756326I$ | $4.85639 + 5.95300I$ | 0 |
| $u = -0.36108 + 1.39647I$ $a = 0.122876 - 0.802100I$ $b = -1.139770 - 0.340743I$ | $3.48788 + 4.66001I$ | 0 |
| $u = -0.36108 - 1.39647I$ $a = 0.122876 + 0.802100I$ $b = -1.139770 + 0.340743I$ | $3.48788 - 4.66001I$ | 0 |
| $u = 0.07894 + 1.44216I$ $a = -0.486845 + 0.329254I$ $b = 0.597577 + 0.105019I$ | $4.25653 - 2.34263I$ | 0 |
| $u = 0.07894 - 1.44216I$ $a = -0.486845 - 0.329254I$ $b = 0.597577 - 0.105019I$ | $4.25653 + 2.34263I$ | 0 |
| $u = -0.08287 + 1.45274I$ $a = -0.032477 - 0.564797I$ $b = 1.52142 - 1.45896I$ | $8.24791 + 7.87039I$ | 0 |
| $u = -0.08287 - 1.45274I$ $a = -0.032477 + 0.564797I$ $b = 1.52142 + 1.45896I$ | $8.24791 - 7.87039I$ | 0 |
| $u = 0.05320 + 1.46336I$ $a = 0.102394 - 0.626085I$ $b = -1.53564 - 1.33318I$ | $9.50325 - 1.59468I$ | 0 |
| $u = 0.05320 - 1.46336I$ $a = 0.102394 + 0.626085I$ $b = -1.53564 + 1.33318I$ | $9.50325 + 1.59468I$ | 0 |
| $u = 0.22989 + 1.44877I$ $a = -0.411847 - 0.386300I$ $b = 0.905278 - 0.212128I$ | $4.49854 - 3.18827I$ | 0 |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|----------------------------------------------------------------------------------------|---------------------------------------|----------------------|
| $u = 0.22989 - 1.44877I$ $a = -0.411847 + 0.386300I$ $b = 0.905278 + 0.212128I$ | $4.49854 + 3.18827I$ | 0 |
| $u = -0.15821 + 1.50551I$ $a = -0.322940 + 0.524993I$ $b = 1.51290 + 1.44929I$ | $1.86412 + 2.79438I$ | 0 |
| $u = -0.15821 - 1.50551I$ $a = -0.322940 - 0.524993I$ $b = 1.51290 - 1.44929I$ | $1.86412 - 2.79438I$ | 0 |
| $u = -0.26974 + 1.50622I$ $a = -0.426211 + 0.822881I$ $b = 1.37603 + 1.14435I$ | $1.59018 + 11.31720I$ | 0 |
| $u = -0.26974 - 1.50622I$ $a = -0.426211 - 0.822881I$ $b = 1.37603 - 1.14435I$ | $1.59018 - 11.31720I$ | 0 |
| $u = -0.16267 + 1.52973I$ $a = 0.382263 - 1.108690I$ $b = -1.03432 - 1.06257I$ | $12.30370 + 3.96400I$ | 0 |
| $u = -0.16267 - 1.52973I$ $a = 0.382263 + 1.108690I$ $b = -1.03432 + 1.06257I$ | $12.30370 - 3.96400I$ | 0 |
| $u = 0.18492 + 1.52917I$ $a = -0.417567 - 1.145640I$ $b = 0.98384 - 1.05662I$ | $11.7350 - 10.0840I$ | 0 |
| $u = 0.18492 - 1.52917I$ $a = -0.417567 + 1.145640I$ $b = 0.98384 + 1.05662I$ | $11.7350 + 10.0840I$ | 0 |
| $u = -0.432055 + 0.119830I$ $a = 2.55471 - 1.22452I$ $b = -0.044675 - 0.746253I$ | $-4.65347 + 1.58657I$ | $-18.0760 - 5.0651I$ |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|-----------------------------------------------------------------------------------------|---------------------------------------|----------------------|
| $u = -0.432055 - 0.119830I$ $a = 2.55471 + 1.22452I$ $b = -0.044675 + 0.746253I$ | $-4.65347 - 1.58657I$ | $-18.0760 + 5.0651I$ |
| $u = 0.22002 + 1.54229I$ $a = 0.298221 + 0.715340I$ $b = -1.34974 + 1.24577I$ | $5.82778 - 7.35075I$ | 0 |
| $u = 0.22002 - 1.54229I$ $a = 0.298221 - 0.715340I$ $b = -1.34974 - 1.24577I$ | $5.82778 + 7.35075I$ | 0 |
| $u = -0.302154 + 0.310620I$ $a = -0.75478 - 1.86193I$ $b = -0.802818 - 0.371080I$ | $1.39676 + 0.94200I$ | $2.74708 - 1.79626I$ |
| $u = -0.302154 - 0.310620I$ $a = -0.75478 + 1.86193I$ $b = -0.802818 + 0.371080I$ | $1.39676 - 0.94200I$ | $2.74708 + 1.79626I$ |
| $u = -0.39405 + 1.52992I$ $a = -0.136506 - 0.583115I$ $b = -1.240480 - 0.206889I$ | $8.78555 + 7.95703I$ | 0 |
| $u = -0.39405 - 1.52992I$ $a = -0.136506 + 0.583115I$ $b = -1.240480 + 0.206889I$ | $8.78555 - 7.95703I$ | 0 |
| $u = -0.33049 + 1.54999I$ $a = -0.329380 + 1.000270I$ $b = 1.30921 + 1.13495I$ | $8.7501 + 17.7563I$ | 0 |
| $u = -0.33049 - 1.54999I$ $a = -0.329380 - 1.000270I$ $b = 1.30921 - 1.13495I$ | $8.7501 - 17.7563I$ | 0 |
| $u = 0.36490 + 1.54676I$ $a = 0.117742 - 0.505610I$ $b = 1.221630 - 0.164568I$ | $9.04062 - 2.10865I$ | 0 |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|----------------------------------------------------------------------------------------|---------------------------------------|-----------------------|
| $u = 0.36490 - 1.54676I$ $a = 0.117742 + 0.505610I$ $b = 1.221630 + 0.164568I$ | $9.04062 + 2.10865I$ | 0 |
| $u = 0.31398 + 1.55993I$ $a = 0.300575 + 0.960470I$ $b = -1.31158 + 1.14390I$ | $9.7899 - 11.4746I$ | 0 |
| $u = 0.31398 - 1.55993I$ $a = 0.300575 - 0.960470I$ $b = -1.31158 - 1.14390I$ | $9.7899 + 11.4746I$ | 0 |
| $u = -0.08128 + 1.64860I$ $a = 0.028304 + 0.509904I$ $b = 0.822211 + 0.788008I$ | $11.99200 - 3.14737I$ | 0 |
| $u = -0.08128 - 1.64860I$ $a = 0.028304 - 0.509904I$ $b = 0.822211 - 0.788008I$ | $11.99200 + 3.14737I$ | 0 |
| $u = 0.10434 + 1.64928I$ $a = -0.003519 + 0.543798I$ $b = -0.773988 + 0.990417I$ | $12.24620 - 3.34962I$ | 0 |
| $u = 0.10434 - 1.64928I$ $a = -0.003519 - 0.543798I$ $b = -0.773988 - 0.990417I$ | $12.24620 + 3.34962I$ | 0 |
| $u = -0.221340 + 0.262334I$ $a = -0.24762 - 2.74062I$ $b = 1.136950 - 0.677233I$ | $2.50372 + 6.70631I$ | $-3.73155 - 9.87202I$ |
| $u = -0.221340 - 0.262334I$ $a = -0.24762 + 2.74062I$ $b = 1.136950 + 0.677233I$ | $2.50372 - 6.70631I$ | $-3.73155 + 9.87202I$ |
| $u = 0.124604 + 0.292582I$ $a = 0.05172 - 3.01208I$ $b = -1.093190 - 0.559521I$ | $3.60147 - 0.87136I$ | $-0.00314 + 3.86305I$ |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|----------------------------------------------------------------------------------------|---------------------------------------|-----------------------|
| $u = 0.124604 - 0.292582I$ $a = 0.05172 + 3.01208I$ $b = -1.093190 + 0.559521I$ | $3.60147 + 0.87136I$ | $-0.00314 - 3.86305I$ |
| $u = 0.06671 + 1.72517I$ $a = -0.001259 + 0.505447I$ $b = -0.189722 + 0.994971I$ | $12.32950 - 3.40052I$ | 0 |
| $u = 0.06671 - 1.72517I$ $a = -0.001259 - 0.505447I$ $b = -0.189722 - 0.994971I$ | $12.32950 + 3.40052I$ | 0 |
| $u = -0.103847$ $a = -4.37876$ $b = 1.68237$ | -2.69516 | 13.1080 |
| $u = -0.0689560 + 0.0164691I$ $a = 22.0368 + 2.7202I$ $b = 0.001158 - 0.786430I$ | $-1.81294 - 2.56110I$ | $-15.8787 + 2.7284I$ |
| $u = -0.0689560 - 0.0164691I$ $a = 22.0368 - 2.7202I$ $b = 0.001158 + 0.786430I$ | $-1.81294 + 2.56110I$ | $-15.8787 - 2.7284I$ |

II.

$$I_2^u = \langle -u^{23} + u^{22} + \dots + b + 1, u^{23} - u^{22} + \dots + a - 2u, u^{24} - u^{23} + \dots - 2u - 1 \rangle$$

(i) Arc colorings

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

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

$$a_1 = \begin{pmatrix} -u^{23} + u^{22} + \dots - 2u^3 + 2u \\ u^{23} - u^{22} + \dots - 4u - 1 \end{pmatrix}$$

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

$$a_{11} = \begin{pmatrix} 5u^{23} - 4u^{22} + \dots - 2u - 1 \\ u^{23} - u^{22} + \dots - 2u^2 + u \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -u^{23} + 13u^{22} + \dots - 24u - 11 \\ u^{22} - u^{21} + \dots - 2u^3 + 3u^2 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -u^{23} + 13u^{22} + \dots - 3u - 11 \\ 8u^{23} - 7u^{22} + \dots - 17u - 1 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

$$a_6 = \begin{pmatrix} u^2 + 1 \\ u^4 + 2u^2 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -2u^{23} + 2u^{22} + \dots + 6u + 1 \\ u^{23} - u^{22} + \dots - 4u - 1 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -6u^{23} + 6u^{22} + \dots + u - 1 \\ -u^{21} + u^{20} + \dots + 5u + 1 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -5u^{23} + 5u^{22} + \dots + 12u^2 + 4u \\ 4u^{23} - 4u^{22} + \dots - u^2 + 1 \end{pmatrix}$$

(ii) Obstruction class = 1

(iii) Cusp Shapes = $-21u^{23} + 35u^{22} - 273u^{21} + 422u^{20} - 1500u^{19} + 2156u^{18} - 4556u^{17} + 6074u^{16} - 8415u^{15} + 10261u^{14} - 9932u^{13} + 10626u^{12} - 7936u^{11} + 6806u^{10} - 4685u^9 + 2969u^8 - 2022u^7 + 1091u^6 - 519u^5 + 154u^4 - 150u^3 - 138u^2 - 41u - 41$

(iv) u-Polynomials at the component

| Crossings | u-Polynomials at each crossing |
|------------|---------------------------------------|
| c_1 | $u^{24} - 10u^{23} + \dots - 16u + 1$ |
| c_2 | $u^{24} - 5u^{22} + \dots - 8u^2 + 1$ |
| c_3 | $u^{24} - u^{23} + \dots - 3u - 1$ |
| c_4, c_5 | $u^{24} - u^{23} + \dots - 2u - 1$ |
| c_6 | $u^{24} - 5u^{22} + \dots - 8u^2 + 1$ |
| c_7 | $u^{24} + 10u^{23} + \dots + 16u + 1$ |
| c_8 | $u^{24} + 4u^{23} + \dots + 3u + 1$ |
| c_9 | $u^{24} + u^{23} + \dots + 2u - 1$ |
| c_{10} | $u^{24} - 8u^{22} + \dots + 10u + 1$ |
| c_{11} | $u^{24} - 4u^{23} + \dots - 3u + 1$ |
| c_{12} | $u^{24} - 3u^{23} + \dots - u - 1$ |

(v) Riley Polynomials at the component

| Crossings | Riley Polynomials at each crossing |
|-----------------|---------------------------------------|
| c_1, c_7 | $y^{24} + 18y^{23} + \dots - 12y + 1$ |
| c_2, c_6 | $y^{24} - 10y^{23} + \dots - 16y + 1$ |
| c_3 | $y^{24} - y^{23} + \dots - 3y + 1$ |
| c_4, c_5, c_9 | $y^{24} + 27y^{23} + \dots + 12y + 1$ |
| c_8, c_{11} | $y^{24} - 24y^{23} + \dots - 23y + 1$ |
| c_{10} | $y^{24} - 16y^{23} + \dots - 28y + 1$ |
| c_{12} | $y^{24} - 3y^{23} + \dots - y + 1$ |

(vi) Complex Volumes and Cusp Shapes

| Solutions to I_2^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|-------------------------------------------------------------------------------------------|---------------------------------------|-----------------------|
| $u = 0.882514$ $a = 0.775023$ $b = 0.725355$ | -0.303774 | 4.40390 |
| $u = 0.650217 + 0.467956I$ $a = 1.005720 - 0.043140I$ $b = 0.670895 - 0.303787I$ | $3.09737 - 0.28324I$ | $-3.73574 + 2.47523I$ |
| $u = 0.650217 - 0.467956I$ $a = 1.005720 + 0.043140I$ $b = 0.670895 + 0.303787I$ | $3.09737 + 0.28324I$ | $-3.73574 - 2.47523I$ |
| $u = -0.005795 + 1.248900I$ $a = 0.14014 + 1.74940I$ $b = -0.055008 + 1.016190I$ | $1.26651 - 2.51743I$ | $-9.47589 + 2.84740I$ |
| $u = -0.005795 - 1.248900I$ $a = 0.14014 - 1.74940I$ $b = -0.055008 - 1.016190I$ | $1.26651 + 2.51743I$ | $-9.47589 - 2.84740I$ |
| $u = -0.528342 + 0.503976I$ $a = -1.143570 + 0.069532I$ $b = -0.648115 - 0.388354I$ | $2.38294 - 5.57243I$ | $-5.11246 + 2.79559I$ |
| $u = -0.528342 - 0.503976I$ $a = -1.143570 - 0.069532I$ $b = -0.648115 + 0.388354I$ | $2.38294 + 5.57243I$ | $-5.11246 - 2.79559I$ |
| $u = -0.017126 + 1.282440I$ $a = 0.267953 + 1.068660I$ $b = -0.248287 + 1.383220I$ | $-0.89975 + 1.19390I$ | $-6.13028 - 5.25521I$ |
| $u = -0.017126 - 1.282440I$ $a = 0.267953 - 1.068660I$ $b = -0.248287 - 1.383220I$ | $-0.89975 - 1.19390I$ | $-6.13028 + 5.25521I$ |
| $u = -0.197638 + 1.311080I$ $a = 0.912382 - 0.623699I$ $b = -1.057030 + 0.054669I$ | $5.47759 + 8.15375I$ | $-1.09675 - 7.59058I$ |

| Solutions to I_2^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|-------------------------------------------------------------------------------------------|---------------------------------------|------------------------|
| $u = -0.197638 - 1.311080I$ $a = 0.912382 + 0.623699I$ $b = -1.057030 - 0.054669I$ | $5.47759 - 8.15375I$ | $-1.09675 + 7.59058I$ |
| $u = 0.236962 + 1.317760I$ $a = -0.739794 - 0.815911I$ $b = 0.979034 - 0.089971I$ | $6.29425 - 2.85089I$ | $1.25649 + 2.53657I$ |
| $u = 0.236962 - 1.317760I$ $a = -0.739794 + 0.815911I$ $b = 0.979034 + 0.089971I$ | $6.29425 + 2.85089I$ | $1.25649 - 2.53657I$ |
| $u = -0.016155 + 0.581226I$ $a = -0.16092 + 2.19525I$ $b = -0.030724 - 0.684852I$ | $-1.28254 + 2.59452I$ | $0.56909 - 3.77369I$ |
| $u = -0.016155 - 0.581226I$ $a = -0.16092 - 2.19525I$ $b = -0.030724 + 0.684852I$ | $-1.28254 - 2.59452I$ | $0.56909 + 3.77369I$ |
| $u = -0.15446 + 1.43775I$ $a = 0.351453 - 0.358325I$ $b = -1.62345 - 0.67224I$ | $2.16033 + 1.97133I$ | $-3.78347 - 0.31532I$ |
| $u = -0.15446 - 1.43775I$ $a = 0.351453 + 0.358325I$ $b = -1.62345 + 0.67224I$ | $2.16033 - 1.97133I$ | $-3.78347 + 0.31532I$ |
| $u = 0.30125 + 1.42260I$ $a = -0.282666 - 0.725720I$ $b = 0.909722 - 0.446607I$ | $4.59240 - 4.26250I$ | $-1.37425 + 5.16068I$ |
| $u = 0.30125 - 1.42260I$ $a = -0.282666 + 0.725720I$ $b = 0.909722 + 0.446607I$ | $4.59240 + 4.26250I$ | $-1.37425 - 5.16068I$ |
| $u = -0.076290 + 0.473510I$ $a = -0.414901 + 1.324540I$ $b = -0.192580 - 0.897422I$ | $-3.93023 - 0.90838I$ | $-11.11521 - 1.01848I$ |

| Solutions to I_2^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|-------------------------------------------------------------------------------------------|---------------------------------------|------------------------|
| $u = -0.076290 - 0.473510I$ $a = -0.414901 - 1.324540I$ $b = -0.192580 + 0.897422I$ | $-3.93023 + 0.90838I$ | $-11.11521 + 1.01848I$ |
| $u = -0.383950$ $a = -0.626250$ $b = -1.39165$ | -2.94621 | -20.3440 |
| $u = 0.05810 + 1.76037I$ $a = -0.010170 - 0.442675I$ $b = 0.128696 - 1.064870I$ | $12.07500 - 3.44844I$ | $-19.5316 + 5.2163I$ |
| $u = 0.05810 - 1.76037I$ $a = -0.010170 + 0.442675I$ $b = 0.128696 + 1.064870I$ | $12.07500 + 3.44844I$ | $-19.5316 - 5.2163I$ |

$$\text{III. } I_3^u = \langle b - u, a - u, u^{15} + 3u^{13} + \dots - 2u + 1 \rangle$$

(i) Arc colorings

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

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

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

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

$$a_{11} = \begin{pmatrix} u^3 \\ u^3 + u \end{pmatrix}$$

$$a_3 = \begin{pmatrix} u^6 + u^4 + 1 \\ u^6 + 2u^4 + u^2 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} u^{11} + 2u^9 + u^3 \\ u^{11} + 3u^9 + 2u^7 - u^5 - u^3 + u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

$$a_6 = \begin{pmatrix} u^2 + 1 \\ u^4 + 2u^2 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

$$a_7 = \begin{pmatrix} -u^7 - 2u^5 + 2u \\ -u^9 - 3u^7 - u^5 + 2u^3 + u \end{pmatrix}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes = $-4u^{10} - 8u^8 + 4u^6 - 4u^5 + 8u^4 - 4u^3 - 4u^2 + 4u - 10$

(iv) u-Polynomials at the component

| Crossings | u-Polynomials at each crossing |
|-----------------------------|------------------------------------------------------------------------------------|
| c_1, c_7 | $(u^3 + u^2 + 2u + 1)^5$ |
| c_2, c_6 | $(u^3 - u^2 + 1)^5$ |
| c_3 | $u^{15} - 3u^{13} + \dots - 4u - 1$ |
| c_4, c_5, c_9 c_{12} | $u^{15} + 3u^{13} - u^{10} - 5u^9 - 2u^8 + u^6 + 5u^5 + 2u^4 + u^3 - u^2 - 2u - 1$ |
| c_8, c_{11} | $u^{15} - 6u^{14} + \dots + 2u + 1$ |
| c_{10} | $u^{15} + 6u^{14} + \dots + 2u - 1$ |

(v) Riley Polynomials at the component

| Crossings | Riley Polynomials at each crossing |
|-----------------------------|--------------------------------------|
| c_1, c_7 | $(y^3 + 3y^2 + 2y - 1)^5$ |
| c_2, c_6 | $(y^3 - y^2 + 2y - 1)^5$ |
| c_3 | $y^{15} - 6y^{14} + \dots + 6y - 1$ |
| c_4, c_5, c_9 c_{12} | $y^{15} + 6y^{14} + \dots + 2y - 1$ |
| c_8, c_{10}, c_{11} | $y^{15} - 18y^{14} + \dots + 2y - 1$ |

(vi) Complex Volumes and Cusp Shapes

| Solutions to I_3^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|-------------------------------------------------------------------------------------------|---------------------------------------|-----------------------|
| $u = -0.973023 + 0.225695I$ $a = -0.973023 + 0.225695I$ $b = -0.973023 + 0.225695I$ | $3.02413 + 2.82812I$ | $-2.49024 - 2.97945I$ |
| $u = -0.973023 - 0.225695I$ $a = -0.973023 - 0.225695I$ $b = -0.973023 - 0.225695I$ | $3.02413 - 2.82812I$ | $-2.49024 + 2.97945I$ |
| $u = 0.935820 + 0.276972I$ $a = 0.935820 + 0.276972I$ $b = 0.935820 + 0.276972I$ | $3.02413 + 2.82812I$ | $-2.49024 - 2.97945I$ |
| $u = 0.935820 - 0.276972I$ $a = 0.935820 - 0.276972I$ $b = 0.935820 - 0.276972I$ | $3.02413 - 2.82812I$ | $-2.49024 + 2.97945I$ |
| $u = -0.212589 + 1.029940I$ $a = -0.212589 + 1.029940I$ $b = -0.212589 + 1.029940I$ | $3.02413 - 2.82812I$ | $-2.49024 + 2.97945I$ |
| $u = -0.212589 - 1.029940I$ $a = -0.212589 - 1.029940I$ $b = -0.212589 - 1.029940I$ | $3.02413 + 2.82812I$ | $-2.49024 - 2.97945I$ |
| $u = -0.929962$ $a = -0.929962$ $b = -0.929962$ | -1.11345 | -9.01950 |
| $u = 0.266832 + 0.879121I$ $a = 0.266832 + 0.879121I$ $b = 0.266832 + 0.879121I$ | $3.02413 - 2.82812I$ | $-2.49024 + 2.97945I$ |
| $u = 0.266832 - 0.879121I$ $a = 0.266832 - 0.879121I$ $b = 0.266832 - 0.879121I$ | $3.02413 + 2.82812I$ | $-2.49024 - 2.97945I$ |
| $u = -0.075026 + 1.285100I$ $a = -0.075026 + 1.285100I$ $b = -0.075026 + 1.285100I$ | -1.11345 | $-9.01951 + 0.I$ |

| Solutions to I_3^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|-------------------------------------------------------------------------------------------|---------------------------------------|-----------------------|
| $u = -0.075026 - 1.285100I$ $a = -0.075026 - 1.285100I$ $b = -0.075026 - 1.285100I$ | -1.11345 | $-9.01951 + 0.I$ |
| $u = 0.540007 + 0.279583I$ $a = 0.540007 + 0.279583I$ $b = 0.540007 + 0.279583I$ | -1.11345 | $-9.01951 + 0.I$ |
| $u = 0.540007 - 0.279583I$ $a = 0.540007 - 0.279583I$ $b = 0.540007 - 0.279583I$ | -1.11345 | $-9.01951 + 0.I$ |
| $u = -0.017040 + 1.406390I$ $a = -0.017040 + 1.406390I$ $b = -0.017040 + 1.406390I$ | $3.02413 + 2.82812I$ | $-2.49024 - 2.97945I$ |
| $u = -0.017040 - 1.406390I$ $a = -0.017040 - 1.406390I$ $b = -0.017040 - 1.406390I$ | $3.02413 - 2.82812I$ | $-2.49024 + 2.97945I$ |

IV. u-Polynomials

| Crossings | u-Polynomials at each crossing |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| c_1 | $((u^3 + u^2 + 2u + 1)^5)(u^{24} - 10u^{23} + \dots - 16u + 1)$ $\cdot (u^{96} + 30u^{95} + \dots + 7436u + 784)$ |
| c_2 | $((u^3 - u^2 + 1)^5)(u^{24} - 5u^{22} + \dots - 8u^2 + 1)(u^{96} + 4u^{95} + \dots - 18u + 28)$ |
| c_3 | $(u^{15} - 3u^{13} + \dots - 4u - 1)(u^{24} - u^{23} + \dots - 3u - 1)$ $\cdot (u^{96} - 4u^{94} + \dots + 4071u + 689)$ |
| c_4, c_5 | $(u^{15} + 3u^{13} - u^{10} - 5u^9 - 2u^8 + u^6 + 5u^5 + 2u^4 + u^3 - u^2 - 2u - 1)$ $\cdot (u^{24} - u^{23} + \dots - 2u - 1)(u^{96} - 2u^{95} + \dots + 44u - 1)$ |
| c_6 | $((u^3 - u^2 + 1)^5)(u^{24} - 5u^{22} + \dots - 8u^2 + 1)(u^{96} + 4u^{95} + \dots - 18u + 28)$ |
| c_7 | $((u^3 + u^2 + 2u + 1)^5)(u^{24} + 10u^{23} + \dots + 16u + 1)$ $\cdot (u^{96} + 30u^{95} + \dots + 7436u + 784)$ |
| c_8 | $(u^{15} - 6u^{14} + \dots + 2u + 1)(u^{24} + 4u^{23} + \dots + 3u + 1)$ $\cdot (u^{96} + 5u^{95} + \dots - 5u - 1)$ |
| c_9 | $(u^{15} + 3u^{13} - u^{10} - 5u^9 - 2u^8 + u^6 + 5u^5 + 2u^4 + u^3 - u^2 - 2u - 1)$ $\cdot (u^{24} + u^{23} + \dots + 2u - 1)(u^{96} - 2u^{95} + \dots + 44u - 1)$ |
| c_{10} | $(u^{15} + 6u^{14} + \dots + 2u - 1)(u^{24} - 8u^{22} + \dots + 10u + 1)$ $\cdot (u^{96} + 5u^{95} + \dots - 81964u - 2147)$ |
| c_{11} | $(u^{15} - 6u^{14} + \dots + 2u + 1)(u^{24} - 4u^{23} + \dots - 3u + 1)$ $\cdot (u^{96} + 5u^{95} + \dots - 5u - 1)$ |
| c_{12} | $(u^{15} + 3u^{13} - u^{10} - 5u^9 - 2u^8 + u^6 + 5u^5 + 2u^4 + u^3 - u^2 - 2u - 1)$ $\cdot (u^{24} - 3u^{23} + \dots - u - 1)(u^{96} + 10u^{95} + \dots + 15u + 919)$ |

V. Riley Polynomials

| Crossings | Riley Polynomials at each crossing |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| c_1, c_7 | $((y^3 + 3y^2 + 2y - 1)^5)(y^{24} + 18y^{23} + \dots - 12y + 1)$ $\cdot (y^{96} + 78y^{95} + \dots - 16700912y + 614656)$ |
| c_2, c_6 | $((y^3 - y^2 + 2y - 1)^5)(y^{24} - 10y^{23} + \dots - 16y + 1)$ $\cdot (y^{96} - 30y^{95} + \dots - 7436y + 784)$ |
| c_3 | $(y^{15} - 6y^{14} + \dots + 6y - 1)(y^{24} - y^{23} + \dots - 3y + 1)$ $\cdot (y^{96} - 8y^{95} + \dots - 8914117y + 474721)$ |
| c_4, c_5, c_9 | $(y^{15} + 6y^{14} + \dots + 2y - 1)(y^{24} + 27y^{23} + \dots + 12y + 1)$ $\cdot (y^{96} + 108y^{95} + \dots - 430y + 1)$ |
| c_8, c_{11} | $(y^{15} - 18y^{14} + \dots + 2y - 1)(y^{24} - 24y^{23} + \dots - 23y + 1)$ $\cdot (y^{96} - 43y^{95} + \dots + 43y + 1)$ |
| c_{10} | $(y^{15} - 18y^{14} + \dots + 2y - 1)(y^{24} - 16y^{23} + \dots - 28y + 1)$ $\cdot (y^{96} - 31y^{95} + \dots - 3936130634y + 4609609)$ |
| c_{12} | $(y^{15} + 6y^{14} + \dots + 2y - 1)(y^{24} - 3y^{23} + \dots - y + 1)$ $\cdot (y^{96} - 26y^{95} + \dots - 25910511y + 844561)$ |