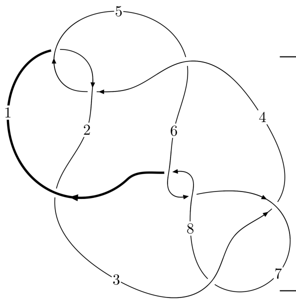
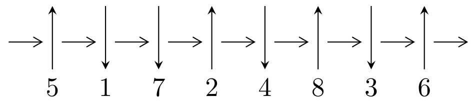
## $8_{12}$ $(K8a_5)$




A knot diagram[1]

**Linearized knot diagam**




**Solving Sequence**

$$3,8 \xrightarrow[c_7]{} 7 \xrightarrow[c_3]{} 4 \xrightarrow[c_6]{} 6 \xrightarrow[c_8]{} 1 \xrightarrow[c_2]{} 2 \xrightarrow[c_5]{} 5 \twoheadrightarrow c_1, c_4$$

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

$$I_1^u = \langle u^{14} - u^{13} + 3u^{12} - 2u^{11} + 6u^{10} - 3u^9 + 7u^8 - 2u^7 + 6u^6 + 4u^4 + 2u^2 + u + 1 \rangle$$

* 1 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 14 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.**

$$\boldsymbol{I_1^u = \langle u^{14} - u^{13} + 3u^{12} - 2u^{11} + 6u^{10} - 3u^9 + 7u^8 - 2u^7 + 6u^6 + 4u^4 + 2u^2 + u + 1\rangle}$$

**(i) Arc colorings**

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

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

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

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

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

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

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

$$a_5 = \begin{pmatrix} u^6 + u^4 + 2u^2 + 1 \\ -u^8 - 2u^6 - 2u^4 - 2u^2 \end{pmatrix}$$

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

**(iii) Cusp Shapes**

$= 4u^{12} - 4u^{11} + 8u^{10} - 8u^9 + 16u^8 - 12u^7 + 12u^6 - 12u^5 + 8u^4 - 4u^3 + 4u^2 - 8u - 2$

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

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1, c_4$ | $u^{14} + u^{13} + \cdots - u + 1$ |
| $c_2, c_5$ | $u^{14} + 5u^{13} + \cdots + 3u + 1$ |
| $c_3, c_7$ | $u^{14} - u^{13} + \cdots + u + 1$ |
| $c_6, c_8$ | $u^{14} - 5u^{13} + \cdots - 3u + 1$ |

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

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1, c_3, c_4$<br>$c_7$ | $y^{14} + 5y^{13} + \cdots + 3y + 1$ |
| $c_2, c_5, c_6$<br>$c_8$ | $y^{14} + 9y^{13} + \cdots + 15y + 1$ |

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

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = \phantom{-}0.772300 + 0.626535I$ | $-1.19029 + 3.41271I$ | $-2.10600 - 2.62516I$ |
| $u = \phantom{-}0.772300 - 0.626535I$ | $-1.19029 - 3.41271I$ | $-2.10600 + 2.62516I$ |
| $u = -0.050221 + 1.076790I$ | $4.64273 + 2.76747I$ | $5.41762 - 3.21377I$ |
| $u = -0.050221 - 1.076790I$ | $4.64273 - 2.76747I$ | $5.41762 + 3.21377I$ |
| $u = \phantom{-}0.727524 + 0.860849I$ | $-4.64273 - 2.76747I$ | $-5.41762 + 3.21377I$ |
| $u = \phantom{-}0.727524 - 0.860849I$ | $-4.64273 + 2.76747I$ | $-5.41762 - 3.21377I$ |
| $u = -0.494052 + 0.663856I$ | $0.022819 + 1.377700I$ | $0.88590 - 4.12207I$ |
| $u = -0.494052 - 0.663856I$ | $0.022819 - 1.377700I$ | $0.88590 + 4.12207I$ |
| $u = -0.622207 + 1.001070I$ | $1.19029 + 3.41271I$ | $2.10600 - 2.62516I$ |
| $u = -0.622207 - 1.001070I$ | $1.19029 - 3.41271I$ | $2.10600 + 2.62516I$ |
| $u = \phantom{-}0.683715 + 1.025590I$ | $- 8.93586I$ | $0. + 7.26077I$ |
| $u = \phantom{-}0.683715 - 1.025590I$ | $8.93586I$ | $0. - 7.26077I$ |
| $u = -0.517057 + 0.454483I$ | $-0.022819 + 1.377700I$ | $-0.88590 - 4.12207I$ |
| $u = -0.517057 - 0.454483I$ | $-0.022819 - 1.377700I$ | $-0.88590 + 4.12207I$ |

### II. u-Polynomials

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1, c_4$ | $u^{14} + u^{13} + \cdots - u + 1$ |
| $c_2, c_5$ | $u^{14} + 5u^{13} + \cdots + 3u + 1$ |
| $c_3, c_7$ | $u^{14} - u^{13} + \cdots + u + 1$ |
| $c_6, c_8$ | $u^{14} - 5u^{13} + \cdots - 3u + 1$ |

### III. Riley Polynomials

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1, c_3, c_4$<br>$c_7$ | $y^{14} + 5y^{13} + \cdots + 3y + 1$ |
| $c_2, c_5, c_6$<br>$c_8$ | $y^{14} + 9y^{13} + \cdots + 15y + 1$ |