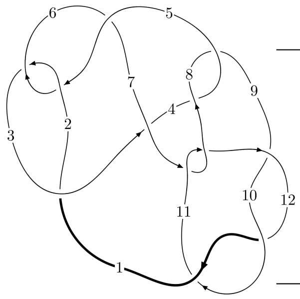
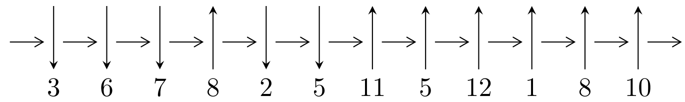
$12n_{0291}$ ($K12n_{0291}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle 2.93542 \times 10^{17} u^{55} - 6.67587 \times 10^{17} u^{54} + \cdots + 2.93396 \times 10^{17} b - 4.34022 \times 10^{16},$$
$$2.00229 \times 10^{18} u^{55} - 6.17396 \times 10^{18} u^{54} + \cdots + 2.93396 \times 10^{17} a - 3.02275 \times 10^{18},\ u^{56} - 4u^{55} + \cdots + 2u + 1$$
$$I_2^u = \langle -u^2 a + u^2 + b,\ 2u^2 a + a^2 + au - 2u^2 - a - 2u - 1,\ u^3 + u^2 - 1 \rangle$$
$$I_3^u = \langle b,\ a - 1,\ u - 1 \rangle$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 63 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.

$\boldsymbol{I_1^u = \langle 2.94\times10^{17}u^{55} - 6.68\times10^{17}u^{54} + \cdots + 2.93\times10^{17}b - 4.34\times10^{16},\ 2.00\times10^{18}u^{55} - 6.17\times10^{18}u^{54} + \cdots + 2.93\times10^{17}a - 3.02\times10^{18},\ u^{56} - 4u^{55} + \cdots + 2u + 1\rangle}$

(i) Arc colorings

$$a_2 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_6 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_3 = \begin{pmatrix}1\\u^2\end{pmatrix}$$
$$a_1 = \begin{pmatrix}-u^2+1\\-u^4\end{pmatrix}$$
$$a_5 = \begin{pmatrix}u\\u\end{pmatrix}$$
$$a_7 = \begin{pmatrix}-u^3\\-u^3+u\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}-6.82450u^{55} + 21.0431u^{54} + \cdots + 1.50746u + 10.3026\\-1.00050u^{55} + 2.27537u^{54} + \cdots - 2.44477u + 0.147930\end{pmatrix}$$
$$a_8 = \begin{pmatrix}3.65406u^{55} - 10.3520u^{54} + \cdots + 5.15325u - 4.23694\\4.10204u^{55} - 12.0354u^{54} + \cdots - 2.31411u - 2.32151\end{pmatrix}$$
$$a_4 = \begin{pmatrix}-u^8+u^6-u^4+1\\-u^8+2u^6-2u^4+2u^2\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}-6.34999u^{55} + 19.7941u^{54} + \cdots - 0.691497u + 9.35095\\-0.586914u^{55} + 1.14134u^{54} + \cdots - 2.44719u + 0.0395175\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}-2.57455u^{55} + 8.57238u^{54} + \cdots - 0.0350557u + 6.04787\\3.43407u^{55} - 10.9313u^{54} + \cdots - 6.20880u - 2.54966\end{pmatrix}$$
$$a_9 = \begin{pmatrix}-3.42363u^{55} + 10.3054u^{54} + \cdots - 4.48816u + 4.34550\\-3.87161u^{55} + 11.9888u^{54} + \cdots + 2.97921u + 2.43006\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -\frac{6957411366946544141}{146698213939434107}u^{55} + \frac{43997122065882996801}{293396427878868214}u^{54} + \cdots + \frac{49895915246887856523}{293396427878868214}u + \frac{196842115834631593\,07}{293396427878868214}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_6	$u^{56} + 20u^{55} + \cdots + 94u + 1$
c_2, c_5	$u^{56} + 4u^{55} + \cdots - 2u + 1$
c_3	$u^{56} - 2u^{55} + \cdots - 37222u + 7489$
c_4, c_8	$u^{56} + 4u^{55} + \cdots + 416u - 64$
c_7, c_{11}	$u^{56} - 4u^{55} + \cdots - 2u - 2$
c_9, c_{10}, c_{12}	$u^{56} + 5u^{55} + \cdots + 3u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_6	$y^{56} + 36y^{55} + \cdots - 6302y + 1$
c_2, c_5	$y^{56} - 20y^{55} + \cdots - 94y + 1$
c_3	$y^{56} - 24y^{55} + \cdots - 5793307970y + 56085121$
c_4, c_8	$y^{56} + 34y^{55} + \cdots - 21504y + 4096$
c_7, c_{11}	$y^{56} - 18y^{55} + \cdots - 80y + 4$
c_9, c_{10}, c_{12}	$y^{56} - 47y^{55} + \cdots - 71y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.555632+0.820839I$ $a=-1.310140+0.452763I$ $b=-0.50995+1.32573I$	$6.89840-1.70687I$	$11.04654+2.11039I$
$u=-0.555632-0.820839I$ $a=-1.310140-0.452763I$ $b=-0.50995-1.32573I$	$6.89840+1.70687I$	$11.04654-2.11039I$
$u=-0.746093+0.643224I$ $a=1.79687-0.81232I$ $b=0.61922-1.61203I$	$2.14654+0.63049I$	$4.81685+0.I$
$u=-0.746093-0.643224I$ $a=1.79687+0.81232I$ $b=0.61922+1.61203I$	$2.14654-0.63049I$	$4.81685+0.I$
$u=0.611315+0.811190I$ $a=0.82986+1.25644I$ $b=-0.84573+1.32108I$	$-1.11438+4.39097I$	$2.00000-3.05982I$
$u=0.611315-0.811190I$ $a=0.82986-1.25644I$ $b=-0.84573-1.32108I$	$-1.11438-4.39097I$	$2.00000+3.05982I$
$u=0.639496+0.745500I$ $a=0.21432+1.59797I$ $b=-0.18371+1.40658I$	$2.28095+2.17813I$	$5.60335-1.04644I$
$u=0.639496-0.745500I$ $a=0.21432-1.59797I$ $b=-0.18371-1.40658I$	$2.28095-2.17813I$	$5.60335+1.04644I$
$u=-1.057330+0.031394I$ $a=1.059980+0.396752I$ $b=1.037210-0.754122I$	$-3.27157+1.64123I$	0
$u=-1.057330-0.031394I$ $a=1.059980-0.396752I$ $b=1.037210+0.754122I$	$-3.27157-1.64123I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.815754 + 0.715389I$ $a = 2.13178 - 1.95768I$ $b = 0.80101 - 3.45506I$	$4.64235 + 1.91730I$	0
$u = -0.815754 - 0.715389I$ $a = 2.13178 + 1.95768I$ $b = 0.80101 + 3.45506I$	$4.64235 - 1.91730I$	0
$u = 0.646892 + 0.638776I$ $a = -0.850743 - 0.918967I$ $b = 0.826318 - 0.495030I$	$1.49600 - 0.77880I$	$5.52001 + 0.97967I$
$u = 0.646892 - 0.638776I$ $a = -0.850743 + 0.918967I$ $b = 0.826318 + 0.495030I$	$1.49600 + 0.77880I$	$5.52001 - 0.97967I$
$u = 0.655547 + 0.884678I$ $a = -1.01004 - 1.55997I$ $b = 0.57473 - 1.83740I$	$3.85590 + 9.25734I$	0
$u = 0.655547 - 0.884678I$ $a = -1.01004 + 1.55997I$ $b = 0.57473 + 1.83740I$	$3.85590 - 9.25734I$	0
$u = 0.859653 + 0.688129I$ $a = 0.664066 - 0.017009I$ $b = -0.054388 - 0.658388I$	$11.29430 - 2.64795I$	0
$u = 0.859653 - 0.688129I$ $a = 0.664066 + 0.017009I$ $b = -0.054388 + 0.658388I$	$11.29430 + 2.64795I$	0
$u = 0.876983 + 0.151494I$ $a = 0.1160180 + 0.0212256I$ $b = -0.393762 - 0.405166I$	$-1.49543 - 0.33054I$	$-5.58521 + 0.41922I$
$u = 0.876983 - 0.151494I$ $a = 0.1160180 - 0.0212256I$ $b = -0.393762 + 0.405166I$	$-1.49543 + 0.33054I$	$-5.58521 - 0.41922I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.115310 + 0.073858I$ $a = -0.302761 + 0.507491I$ $b = -0.541213 - 0.678094I$	$-7.34462 + 3.52834I$	0
$u = -1.115310 - 0.073858I$ $a = -0.302761 - 0.507491I$ $b = -0.541213 + 0.678094I$	$-7.34462 - 3.52834I$	0
$u = -0.947166 + 0.640358I$ $a = -1.40216 + 1.01867I$ $b = -0.74124 + 2.06542I$	$1.51907 + 4.39807I$	0
$u = -0.947166 - 0.640358I$ $a = -1.40216 - 1.01867I$ $b = -0.74124 - 2.06542I$	$1.51907 - 4.39807I$	0
$u = -0.904546 + 0.704031I$ $a = -2.66914 + 2.18937I$ $b = -0.75000 + 3.34742I$	$4.37132 + 3.51272I$	0
$u = -0.904546 - 0.704031I$ $a = -2.66914 - 2.18937I$ $b = -0.75000 - 3.34742I$	$4.37132 - 3.51272I$	0
$u = 0.199557 + 0.823827I$ $a = -0.188450 + 0.800184I$ $b = -0.896805 - 0.162123I$	$1.27100 - 5.53243I$	$6.88478 + 5.95128I$
$u = 0.199557 - 0.823827I$ $a = -0.188450 - 0.800184I$ $b = -0.896805 + 0.162123I$	$1.27100 + 5.53243I$	$6.88478 - 5.95128I$
$u = -1.149520 + 0.171385I$ $a = -0.352409 - 0.425484I$ $b = 0.086994 + 0.749495I$	$-3.37562 + 8.61142I$	0
$u = -1.149520 - 0.171385I$ $a = -0.352409 + 0.425484I$ $b = 0.086994 - 0.749495I$	$-3.37562 - 8.61142I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.877750+0.767459I$ $a=0.61912+1.30040I$ $b=1.71436+0.44120I$	$3.73144+2.89531I$	0
$u=-0.877750-0.767459I$ $a=0.61912-1.30040I$ $b=1.71436-0.44120I$	$3.73144-2.89531I$	0
$u=0.996417+0.644457I$ $a=1.098620-0.312059I$ $b=1.46572+1.16153I$	$0.45076-4.30103I$	0
$u=0.996417-0.644457I$ $a=1.098620+0.312059I$ $b=1.46572-1.16153I$	$0.45076+4.30103I$	0
$u=0.807123$ $a=3.25049$ $b=-1.20792$	0.339779	61.8040
$u=1.041510+0.583028I$ $a=1.391730-0.045593I$ $b=1.52856+0.47260I$	$-4.20570-3.27627I$	0
$u=1.041510-0.583028I$ $a=1.391730+0.045593I$ $b=1.52856-0.47260I$	$-4.20570+3.27627I$	0
$u=0.386849+0.703387I$ $a=0.080082-1.229030I$ $b=0.502755-0.488230I$	$-2.39037-1.55268I$	$1.61575+2.61232I$
$u=0.386849-0.703387I$ $a=0.080082+1.229030I$ $b=0.502755+0.488230I$	$-2.39037+1.55268I$	$1.61575-2.61232I$
$u=1.115730+0.439932I$ $a=-0.739493+0.517959I$ $b=-1.131660+0.027778I$	$-1.67584+0.98983I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.115730 - 0.439932I$ $a = -0.739493 - 0.517959I$ $b = -1.131660 - 0.027778I$	$-1.67584 - 0.98983I$	0
$u = 1.21660$ $a = -0.482061$ $b = 0.154807$	0.661022	0
$u = 1.013820 + 0.677594I$ $a = -1.87407 - 0.28208I$ $b = -1.80895 - 0.83661I$	$1.16708 - 7.61471I$	0
$u = 1.013820 - 0.677594I$ $a = -1.87407 + 0.28208I$ $b = -1.80895 + 0.83661I$	$1.16708 + 7.61471I$	0
$u = 1.043410 + 0.693114I$ $a = -1.80141 - 0.10454I$ $b = -1.81609 - 1.65261I$	$-2.41199 - 10.04440I$	0
$u = 1.043410 - 0.693114I$ $a = -1.80141 + 0.10454I$ $b = -1.81609 + 1.65261I$	$-2.41199 + 10.04440I$	0
$u = -1.063310 + 0.686319I$ $a = 1.20482 - 1.11113I$ $b = 0.57272 - 1.88306I$	$5.39990 + 7.34868I$	0
$u = -1.063310 - 0.686319I$ $a = 1.20482 + 1.11113I$ $b = 0.57272 + 1.88306I$	$5.39990 - 7.34868I$	0
$u = -0.906500 + 0.883744I$ $a = 0.426122 + 0.260836I$ $b = 0.259723 + 0.288378I$	$8.38533 + 3.24583I$	0
$u = -0.906500 - 0.883744I$ $a = 0.426122 - 0.260836I$ $b = 0.259723 - 0.288378I$	$8.38533 - 3.24583I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.055930 + 0.737690I$ $a = 2.11012 + 0.58896I$ $b = 1.89812 + 2.08623I$	$2.6209 - 15.2730I$	0
$u = 1.055930 - 0.737690I$ $a = 2.11012 - 0.58896I$ $b = 1.89812 - 2.08623I$	$2.6209 + 15.2730I$	0
$u = -0.665378$ $a = -2.70313$ $b = -1.90693$	7.93809	29.4940
$u = 0.372658 + 0.279589I$ $a = -1.53134 - 0.64420I$ $b = 1.017650 - 0.002132I$	$1.155810 - 0.800051I$	$6.92184 - 0.19721I$
$u = 0.372658 - 0.279589I$ $a = -1.53134 + 0.64420I$ $b = 1.017650 + 0.002132I$	$1.155810 + 0.800051I$	$6.92184 + 0.19721I$
$u = -0.112048$ $a = 5.51199$ $b = 0.496888$	0.859867	11.9670

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 3u^2a - 4u^2 + 3a - 10u + 3$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3	$(u^3 - u^2 + 2u - 1)^2$
c_2	$(u^3 + u^2 - 1)^2$
c_4, c_8	u^6
c_5	$(u^3 - u^2 + 1)^2$
c_6	$(u^3 + u^2 + 2u + 1)^2$
c_7, c_9, c_{10}	$(u^2 - u - 1)^3$
c_{11}, c_{12}	$(u^2 + u - 1)^3$

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.877439+0.744862I$ $a=\ 0.586612+0.101930I$ $b=\ 0.044325+0.562280I$	$11.90680+2.82812I$	$13.45212-4.14885I$
$u=-0.877439+0.744862I$ $a=\ 0.86067+1.76749I$ $b=\ 2.28039+0.56228I$	$4.01109+2.82812I$	$20.9825+0.8478I$
$u=-0.877439-0.744862I$ $a=\ 0.586612-0.101930I$ $b=\ 0.044325-0.562280I$	$11.90680-2.82812I$	$13.45212+4.14885I$
$u=-0.877439-0.744862I$ $a=\ 0.86067-1.76749I$ $b=\ 2.28039-0.56228I$	$4.01109-2.82812I$	$20.9825-0.8478I$
$u=\ 0.754878$ $a=\ 1.51473$ $b=\ 0.293316$	-0.126494	0.305530
$u=\ 0.754878$ $a=-2.40929$ $b=-1.94275$	7.76919	-18.1750

III. $I_3^u = \langle b,\ a-1,\ u-1 \rangle$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 0$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I^u_3		$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u =$	1.00000		
$a =$	1.00000	0	0
$b =$	0		

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u-1)(u^3-u^2+2u-1)^2(u^{56}+20u^{55}+\cdots+94u+1)$
c_2	$(u-1)(u^3+u^2-1)^2(u^{56}+4u^{55}+\cdots-2u+1)$
c_3	$(u-1)(u^3-u^2+2u-1)^2(u^{56}-2u^{55}+\cdots-37222u+7489)$
c_4	$u^6(u-1)(u^{56}+4u^{55}+\cdots+416u-64)$
c_5	$(u+1)(u^3-u^2+1)^2(u^{56}+4u^{55}+\cdots-2u+1)$
c_6	$(u+1)(u^3+u^2+2u+1)^2(u^{56}+20u^{55}+\cdots+94u+1)$
c_7	$u(u^2-u-1)^3(u^{56}-4u^{55}+\cdots-2u-2)$
c_8	$u^6(u+1)(u^{56}+4u^{55}+\cdots+416u-64)$
c_9, c_{10}	$(u+1)(u^2-u-1)^3(u^{56}+5u^{55}+\cdots+3u+1)$
c_{11}	$u(u^2+u-1)^3(u^{56}-4u^{55}+\cdots-2u-2)$
c_{12}	$(u-1)(u^2+u-1)^3(u^{56}+5u^{55}+\cdots+3u+1)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_6	$(y-1)(y^3+3y^2+2y-1)^2(y^{56}+36y^{55}+\cdots-6302y+1)$
c_2, c_5	$(y-1)(y^3-y^2+2y-1)^2(y^{56}-20y^{55}+\cdots-94y+1)$
c_3	$(y-1)(y^3+3y^2+2y-1)^2$ $\cdot\,(y^{56}-24y^{55}+\cdots-5793307970y+56085121)$
c_4, c_8	$y^6(y-1)(y^{56}+34y^{55}+\cdots-21504y+4096)$
c_7, c_{11}	$y(y^2-3y+1)^3(y^{56}-18y^{55}+\cdots-80y+4)$
c_9, c_{10}, c_{12}	$(y-1)(y^2-3y+1)^3(y^{56}-47y^{55}+\cdots-71y+1)$