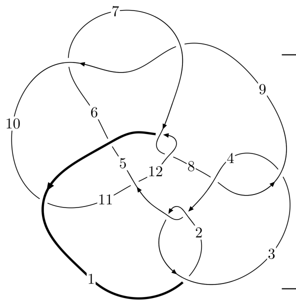
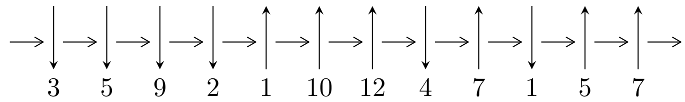
$12n_{0258}$ ($K12n_{0258}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle 102949u^{15} + 169425u^{14} + \cdots + 344734b - 488230,$$
$$475025u^{15} + 757448u^{14} + \cdots + 689468a - 2984519,\ u^{16} + 2u^{15} + \cdots - 15u - 4\rangle$$
$$I_2^u = \langle u^5a + 2u^4a + u^5 + 4u^4 - 2u^2a + 3u^3 - 2au - 2u^2 + 3b - 2a - 3u - 1,\ 4u^4 - 2u^2a - u^3 + a^2 - 7u^2 + 2a + 5$$
$$u^6 + u^5 - u^4 - 2u^3 + u + 1\rangle$$
$$I_3^u = \langle au + b + u + 1,\ a^2 + au + 3,\ u^2 + u - 1\rangle$$
$$I_4^u = \langle 2b + 1,\ a - 1,\ u - 1\rangle$$

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 33 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. $\boldsymbol{I_1^u = \langle 1.03\times10^5 u^{15} + 1.69\times10^5 u^{14} + \cdots + 3.45\times10^5 b - 4.88\times10^5,\ 4.75\times10^5 u^{15} + 7.57\times10^5 u^{14} + \cdots + 6.89\times10^5 a - 2.98\times10^6,\ u^{16} + 2u^{15} + \cdots - 15u - 4\rangle}$

(i) Arc colorings

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

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

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

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

$$a_6 = \begin{pmatrix} u^5-2u^3+u \\ u^5-u^3+u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -0.688973u^{15} - 1.09860u^{14} + \cdots + 10.8060u + 4.32873 \\ -0.298633u^{15} - 0.491466u^{14} + \cdots + 4.30076u + 1.41625 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 0.527611u^{15} + 0.764711u^{14} + \cdots - 7.10340u - 2.57154 \\ 0.0757251u^{15} + 0.157434u^{14} + \cdots - 0.695406u - 0.399317 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -0.396324u^{15} - 0.532866u^{14} + \cdots + 5.76866u + 2.60958 \\ -0.296495u^{15} - 0.408933u^{14} + \cdots + 4.60606u + 1.80754 \end{pmatrix}$$

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

$$a_9 = \begin{pmatrix} -1.08530u^{15} - 1.63146u^{14} + \cdots + 16.5746u + 5.93830 \\ -0.447127u^{15} - 0.705112u^{14} + \cdots + 6.59538u + 2.18466 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -0.396324u^{15} - 0.532866u^{14} + \cdots + 5.76866u + 2.60958 \\ -0.148494u^{15} - 0.213646u^{14} + \cdots + 2.29462u + 0.768413 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 0.896155u^{15} + 1.26037u^{14} + \cdots - 12.0524u - 4.14979 \\ 0.122193u^{15} + 0.231518u^{14} + \cdots - 1.42447u - 0.424931 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{2007761}{689468}u^{15} + \frac{2194435}{689468}u^{14} + \cdots - \frac{28351265}{689468}u - \frac{1282717}{172367}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{16} + 10u^{15} + \cdots + 65u + 16$
c_2, c_4	$u^{16} - 2u^{15} + \cdots + 15u - 4$
c_3, c_8	$u^{16} - 3u^{15} + \cdots + 6u + 8$
c_5	$u^{16} - 3u^{15} + \cdots + 52u + 64$
c_6, c_7, c_9 c_{11}, c_{12}	$u^{16} - u^{15} + \cdots - u - 1$
c_{10}	$u^{16} - 12u^{15} + \cdots - 50u + 4$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{16} - 6y^{15} + \cdots + 1343y + 256$
c_2, c_4	$y^{16} - 10y^{15} + \cdots - 65y + 16$
c_3, c_8	$y^{16} + 3y^{15} + \cdots - 52y + 64$
c_5	$y^{16} + 67y^{15} + \cdots - 140304y + 4096$
c_6, c_7, c_9 c_{11}, c_{12}	$y^{16} + 31y^{15} + \cdots - 9y + 1$
c_{10}	$y^{16} - 36y^{15} + \cdots - 2908y + 16$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.891782$ $a = 0.236674$ $b = -0.553091$	-1.30085	-8.84520
$u = 1.091810 + 0.330825I$ $a = -0.147665 + 0.051010I$ $b = 0.210193 - 0.600885I$	$-3.22144 - 1.13355I$	$-4.59977 + 1.25337I$
$u = 1.091810 - 0.330825I$ $a = -0.147665 - 0.051010I$ $b = 0.210193 + 0.600885I$	$-3.22144 + 1.13355I$	$-4.59977 - 1.25337I$
$u = -1.094020 + 0.526074I$ $a = -1.054950 - 0.663309I$ $b = 0.141861 - 0.569038I$	$-1.87639 + 6.13504I$	$0.06427 - 7.98576I$
$u = -1.094020 - 0.526074I$ $a = -1.054950 + 0.663309I$ $b = 0.141861 + 0.569038I$	$-1.87639 - 6.13504I$	$0.06427 + 7.98576I$
$u = -0.029850 + 1.272860I$ $a = 4.37033 - 0.53285I$ $b = 3.61404 - 0.37068I$	$19.7225 - 4.8173I$	$-2.30205 + 1.82839I$
$u = -0.029850 - 1.272860I$ $a = 4.37033 + 0.53285I$ $b = 3.61404 + 0.37068I$	$19.7225 + 4.8173I$	$-2.30205 - 1.82839I$
$u = -1.31580$ $a = 0.254567$ $b = -1.49207$	-0.940295	-7.17020
$u = -0.296508 + 0.600916I$ $a = 0.432297 - 1.059770I$ $b = -0.140186 - 0.553162I$	$0.34157 - 1.65330I$	$2.57923 + 4.74775I$
$u = -0.296508 - 0.600916I$ $a = 0.432297 + 1.059770I$ $b = -0.140186 + 0.553162I$	$0.34157 + 1.65330I$	$2.57923 - 4.74775I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.537130 + 0.286418I$ $a = 0.60885 + 1.51474I$ $b = -0.016541 + 0.547073I$	$0.96164 + 1.16578I$	$5.62628 - 5.26913I$
$u = -0.537130 - 0.286418I$ $a = 0.60885 - 1.51474I$ $b = -0.016541 - 0.547073I$	$0.96164 - 1.16578I$	$5.62628 + 5.26913I$
$u = -1.42350 + 0.64934I$ $a = -1.89897 + 2.53374I$ $b = -3.64218 + 0.84571I$	$15.4087 + 11.5569I$	$-4.10768 - 4.68861I$
$u = -1.42350 - 0.64934I$ $a = -1.89897 - 2.53374I$ $b = -3.64218 - 0.84571I$	$15.4087 - 11.5569I$	$-4.10768 + 4.68861I$
$u = 1.50121 + 0.66208I$ $a = -1.43051 - 3.06754I$ $b = -3.39461 - 1.98308I$	$15.0197 - 2.0565I$	$-4.37753 + 0.79044I$
$u = 1.50121 - 0.66208I$ $a = -1.43051 + 3.06754I$ $b = -3.39461 + 1.98308I$	$15.0197 + 2.0565I$	$-4.37753 - 0.79044I$

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

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

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_5	$(u^6 - 3u^5 + 5u^4 - 4u^3 + 2u^2 - u + 1)^2$
c_2	$(u^6 + u^5 - u^4 - 2u^3 + u + 1)^2$
c_3, c_8	$u^{12} + 3u^{10} + 5u^8 + 4u^6 + 2u^4 + u^2 + 1$
c_4	$(u^6 - u^5 - u^4 + 2u^3 - u + 1)^2$
c_6, c_7, c_9 c_{11}, c_{12}	$(u^2 + 1)^6$
c_{10}	$u^{12} - 12u^{11} + \cdots - 60u + 9$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_5	$(y^6 + y^5 + 5y^4 + 6y^2 + 3y + 1)^2$
c_2, c_4	$(y^6 - 3y^5 + 5y^4 - 4y^3 + 2y^2 - y + 1)^2$
c_3, c_8	$(y^6 + 3y^5 + 5y^4 + 4y^3 + 2y^2 + y + 1)^2$
c_6, c_7, c_9 c_{11}, c_{12}	$(y + 1)^{12}$
c_{10}	$y^{12} - 14y^{11} + \cdots - 108y + 81$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.002190 + 0.295542I$ $a = 0.387926 + 1.194620I$ $b = 1.74846 - 0.37806I$	$-5.18047 - 0.92430I$	$-9.71672 + 0.79423I$
$u = 1.002190 + 0.295542I$ $a = -0.553835 - 0.009862I$ $b = -0.37806 - 1.74846I$	$-5.18047 - 0.92430I$	$-9.71672 + 0.79423I$
$u = 1.002190 - 0.295542I$ $a = 0.387926 - 1.194620I$ $b = 1.74846 + 0.37806I$	$-5.18047 + 0.92430I$	$-9.71672 - 0.79423I$
$u = 1.002190 - 0.295542I$ $a = -0.553835 + 0.009862I$ $b = -0.37806 + 1.74846I$	$-5.18047 + 0.92430I$	$-9.71672 - 0.79423I$
$u = -0.428243 + 0.664531I$ $a = -2.09808 + 1.60703I$ $b = -1.188690 + 0.647273I$	$-1.39926 - 0.92430I$	$-2.28328 + 0.79423I$
$u = -0.428243 + 0.664531I$ $a = -0.41834 - 2.74535I$ $b = -0.647273 - 1.188690I$	$-1.39926 - 0.92430I$	$-2.28328 + 0.79423I$
$u = -0.428243 - 0.664531I$ $a = -2.09808 - 1.60703I$ $b = -1.188690 - 0.647273I$	$-1.39926 + 0.92430I$	$-2.28328 - 0.79423I$
$u = -0.428243 - 0.664531I$ $a = -0.41834 + 2.74535I$ $b = -0.647273 + 1.188690I$	$-1.39926 + 0.92430I$	$-2.28328 - 0.79423I$
$u = -1.073950 + 0.558752I$ $a = 1.42256 - 0.62619I$ $b = 1.114040 + 0.351534I$	$-3.28987 + 5.69302I$	$-6.00000 - 5.51057I$
$u = -1.073950 + 0.558752I$ $a = -1.74023 - 1.77409I$ $b = 0.351534 - 1.114040I$	$-3.28987 + 5.69302I$	$-6.00000 - 5.51057I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -1.073950 - 0.558752I$ $a = 1.42256 + 0.62619I$ $b = 1.114040 - 0.351534I$	$-3.28987 - 5.69302I$	$-6.00000 + 5.51057I$
$u = -1.073950 - 0.558752I$ $a = -1.74023 + 1.77409I$ $b = 0.351534 + 1.114040I$	$-3.28987 - 5.69302I$	$-6.00000 + 5.51057I$

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

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -6$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_5	$(y^2 - 7y + 1)^2$
c_2, c_3, c_4 c_8	$(y^2 - 3y + 1)^2$
c_6, c_7, c_9 c_{11}, c_{12}	$y^4 + 11y^3 + 82y^2 + 144y + 81$
c_{10}	$(y - 1)^4$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.618034$ $a = -0.30902 + 1.70426I$ $b = -1.42705 - 1.05329I$	-4.27683	-6.00000
$u = 0.618034$ $a = -0.30902 - 1.70426I$ $b = -1.42705 + 1.05329I$	-4.27683	-6.00000
$u = -1.61803$ $a = 0.80902 + 1.53150I$ $b = 1.92705 + 2.47802I$	-12.1725	-6.00000
$u = -1.61803$ $a = 0.80902 - 1.53150I$ $b = 1.92705 - 2.47802I$	-12.1725	-6.00000

IV. $I_4^u = \langle 2b+1,\ a-1,\ u-1 \rangle$

(i) Arc colorings

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

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

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

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

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

$a_{10} = \begin{pmatrix} 1 \\ -0.5 \end{pmatrix}$

$a_7 = \begin{pmatrix} 1 \\ 0.5 \end{pmatrix}$

$a_{11} = \begin{pmatrix} 1 \\ 0.5 \end{pmatrix}$

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

$a_9 = \begin{pmatrix} 2 \\ 0 \end{pmatrix}$

$a_{12} = \begin{pmatrix} 1 \\ -0.5 \end{pmatrix}$

$a_8 = \begin{pmatrix} 2 \\ 0 \end{pmatrix}$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 2.25$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.00000$ $a = 1.00000$ $b = -0.500000$	0	2.25000

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u-1)(u^2+3u+1)^2(u^6-3u^5+5u^4-4u^3+2u^2-u+1)^2$ $\cdot(u^{16}+10u^{15}+\cdots+65u+16)$
c_2	$(u-1)(u^2-u-1)^2(u^6+u^5-u^4-2u^3+u+1)^2$ $\cdot(u^{16}-2u^{15}+\cdots+15u-4)$
c_3, c_8	$u(u^2+u-1)^2(u^{12}+3u^{10}+5u^8+4u^6+2u^4+u^2+1)$ $\cdot(u^{16}-3u^{15}+\cdots+6u+8)$
c_4	$(u+1)(u^2-u-1)^2(u^6-u^5-u^4+2u^3-u+1)^2$ $\cdot(u^{16}-2u^{15}+\cdots+15u-4)$
c_5	$u(u^2+3u+1)^2(u^6-3u^5+5u^4-4u^3+2u^2-u+1)^2$ $\cdot(u^{16}-3u^{15}+\cdots+52u+64)$
c_6, c_7	$(u+1)(u^2+1)^6(u^4+3u^3+\cdots+6u+9)(u^{16}-u^{15}+\cdots-u-1)$
c_9, c_{11}, c_{12}	$(u-1)(u^2+1)^6(u^4+3u^3+\cdots+6u+9)(u^{16}-u^{15}+\cdots-u-1)$
c_{10}	$((u+1)^5)(u^{12}-12u^{11}+\cdots-60u+9)(u^{16}-12u^{15}+\cdots-50u+4)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$(y-1)(y^2-7y+1)^2(y^6+y^5+5y^4+6y^2+3y+1)^2$ $\cdot\,(y^{16}-6y^{15}+\cdots+1343y+256)$
c_2, c_4	$(y-1)(y^2-3y+1)^2(y^6-3y^5+5y^4-4y^3+2y^2-y+1)^2$ $\cdot\,(y^{16}-10y^{15}+\cdots-65y+16)$
c_3, c_8	$y(y^2-3y+1)^2(y^6+3y^5+5y^4+4y^3+2y^2+y+1)^2$ $\cdot\,(y^{16}+3y^{15}+\cdots-52y+64)$
c_5	$y(y^2-7y+1)^2(y^6+y^5+5y^4+6y^2+3y+1)^2$ $\cdot\,(y^{16}+67y^{15}+\cdots-140304y+4096)$
c_6, c_7, c_9 c_{11}, c_{12}	$(y-1)(y+1)^{12}(y^4+11y^3+82y^2+144y+81)$ $\cdot\,(y^{16}+31y^{15}+\cdots-9y+1)$
c_{10}	$((y-1)^5)(y^{12}-14y^{11}+\cdots-108y+81)$ $\cdot\,(y^{16}-36y^{15}+\cdots-2908y+16)$