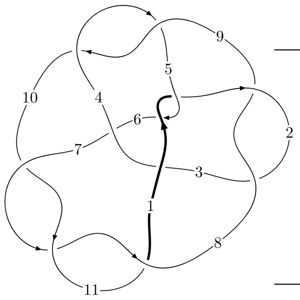
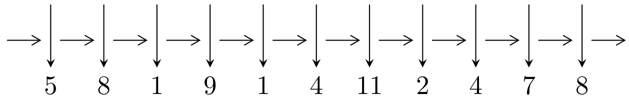
$11n_{169}$ $(K11n_{169})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

$$2,5 \underset{c_1}{\longrightarrow} 1 \underset{c_5}{\longrightarrow} 6,9 \underset{c_4}{\longrightarrow} 4 \underset{c_3}{\longrightarrow} 3 \underset{c_8}{\longrightarrow} 8 \underset{c_{11}}{\longrightarrow} 11 \underset{c_7}{\longrightarrow} 7 \underset{c_{10}}{\longrightarrow} 10 \longrightarrow\!\!\!\!\to c_2, c_6, c_9$$

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

$$I_1^u = \langle -u^{12} + 8u^{11} + \cdots + 4b - 12,\ 3u^{12} - 22u^{11} + \cdots + 8a + 36,\ u^{13} - 8u^{12} + \cdots + 56u - 8\rangle$$
$$I_2^u = \langle u^5 + u^4 + u^3 - u^2 + b - 1,\ u^7 + u^6 + 2u^5 + 2u^3 - 2u^2 + a - 2,\ u^8 + u^7 + 2u^6 - u^5 + u^4 - 3u^3 + u^2 - 2u +$$
$$I_3^u = \langle -5a^5u - 4a^5 + 7a^4 + 5a^3u + 4a^3 + 8a^2u - 2a^2 - 6au + 7b + 5a - 3u - 1,$$
$$a^6 + a^5u - a^4 - 3a^3u - 2a^3 + 3a^2u + a^2 + 2au + 3a - 3u - 1,\ u^2 + u + 1\rangle$$

* 3 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. $I_1^u = \langle -u^{12}+8u^{11}+\cdots+4b-12,\ 3u^{12}-22u^{11}+\cdots+8a+36,\ u^{13}-8u^{12}+\cdots+56u-8\rangle$

(i) Arc colorings

$$a_2 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_5 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_1 = \begin{pmatrix}1\\-u^2\end{pmatrix}$$
$$a_6 = \begin{pmatrix}-u\\u^3+u\end{pmatrix}$$
$$a_9 = \begin{pmatrix}-\frac{3}{8}u^{12}+\frac{11}{4}u^{11}+\cdots+20u-\frac{9}{2}\\ \frac{1}{4}u^{12}-2u^{11}+\cdots-\frac{33}{2}u+3\end{pmatrix}$$
$$a_4 = \begin{pmatrix}\frac{1}{4}u^{12}-2u^{11}+\cdots-13u+\frac{5}{2}\\ \frac{1}{2}u^{11}-3u^{10}+\cdots+\frac{25}{2}u-2\end{pmatrix}$$
$$a_3 = \begin{pmatrix}-\frac{1}{4}u^{12}+\frac{3}{2}u^{11}+\cdots+\frac{3}{2}u+\frac{1}{2}\\ -\frac{1}{2}u^{11}+3u^{10}+\cdots-\frac{23}{2}u+2\end{pmatrix}$$
$$a_8 = \begin{pmatrix}-\frac{1}{8}u^{12}+\frac{3}{4}u^{11}+\cdots+\frac{7}{2}u-\frac{3}{2}\\ \frac{1}{4}u^{12}-2u^{11}+\cdots-\frac{33}{2}u+3\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}\frac{1}{4}u^{12}-2u^{11}+\cdots-14u+\frac{7}{2}\\ \frac{1}{2}u^{12}-\frac{7}{2}u^{11}+\cdots-\frac{29}{2}u+2\end{pmatrix}$$
$$a_7 = \begin{pmatrix}u^{12}-\frac{27}{4}u^{11}+\cdots-\frac{73}{4}u+2\\ -\frac{3}{4}u^{12}+\frac{11}{2}u^{11}+\cdots+29u-4\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}-\frac{1}{4}u^{12}+\frac{5}{4}u^{11}+\cdots-\frac{55}{4}u+4\\ \frac{3}{4}u^{12}-\frac{11}{2}u^{11}+\cdots-29u+4\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}-\frac{1}{4}u^{12}+\frac{5}{4}u^{11}+\cdots-\frac{55}{4}u+4\\ \frac{3}{4}u^{12}-\frac{11}{2}u^{11}+\cdots-29u+4\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes

$= -u^{12}+5u^{11}-15u^{10}+31u^9-51u^8+70u^7-85u^6+89u^5-83u^4+63u^3-43u^2+24u-22$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_5	$u^{13} + 8u^{12} + \cdots + 56u + 8$
c_2, c_4, c_8 c_9	$u^{13} + 3u^{11} + \cdots + 2u + 1$
c_3, c_6	$u^{13} - 2u^{12} + \cdots - 4u + 1$
c_7, c_{10}, c_{11}	$u^{13} + 6u^{12} + \cdots + 14u + 4$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_5	$y^{13} + 4y^{12} + \cdots + 480y - 64$
c_2, c_4, c_8 c_9	$y^{13} + 6y^{12} + \cdots + 2y - 1$
c_3, c_6	$y^{13} - 26y^{12} + \cdots + 42y - 1$
c_7, c_{10}, c_{11}	$y^{13} - 16y^{12} + \cdots + 204y - 16$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.326542 + 1.020100I$ $a = -0.503264 + 0.483746I$ $b = 0.329129 + 0.671341I$	$-1.07131 + 1.81105I$	$-12.48073 - 2.50977I$
$u = -0.326542 - 1.020100I$ $a = -0.503264 - 0.483746I$ $b = 0.329129 - 0.671341I$	$-1.07131 - 1.81105I$	$-12.48073 + 2.50977I$
$u = 1.161480 + 0.385396I$ $a = 0.216539 - 0.581687I$ $b = -0.475687 + 0.592166I$	$-3.17225 + 0.94602I$	$-12.22572 - 6.14642I$
$u = 1.161480 - 0.385396I$ $a = 0.216539 + 0.581687I$ $b = -0.475687 - 0.592166I$	$-3.17225 - 0.94602I$	$-12.22572 + 6.14642I$
$u = 0.270743 + 1.206070I$ $a = 0.733128 - 0.331803I$ $b = -0.598666 - 0.794370I$	$2.89440 - 2.21633I$	$-9.35734 + 3.25180I$
$u = 0.270743 - 1.206070I$ $a = 0.733128 + 0.331803I$ $b = -0.598666 + 0.794370I$	$2.89440 + 2.21633I$	$-9.35734 - 3.25180I$
$u = 0.63465 + 1.27236I$ $a = -0.928004 + 0.162795I$ $b = 0.796089 + 1.077430I$	$-0.15730 - 7.29804I$	$-11.37128 + 6.48312I$
$u = 0.63465 - 1.27236I$ $a = -0.928004 - 0.162795I$ $b = 0.796089 - 1.077430I$	$-0.15730 + 7.29804I$	$-11.37128 - 6.48312I$
$u = 1.26554 + 0.69993I$ $a = -0.057804 + 0.864578I$ $b = 0.678296 - 1.053700I$	$-11.99570 + 3.34885I$	$-12.69425 - 2.28469I$
$u = 1.26554 - 0.69993I$ $a = -0.057804 - 0.864578I$ $b = 0.678296 + 1.053700I$	$-11.99570 - 3.34885I$	$-12.69425 + 2.28469I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.83155 + 1.23498I$ $a = 1.136480 + 0.017597I$ $b = -0.92331 - 1.41816I$	$-10.0617 - 10.8173I$	$-12.24076 + 5.20880I$
$u = 0.83155 - 1.23498I$ $a = 1.136480 - 0.017597I$ $b = -0.92331 + 1.41816I$	$-10.0617 + 10.8173I$	$-12.24076 - 5.20880I$
$u = 0.325158$ $a = -1.19415$ $b = 0.388289$	-0.575325	-17.2600

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 3u^7 + 2u^6 + 4u^5 - 3u^4 + 3u^3 - 7u^2 - u - 11$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_5	$y^8 + 3y^7 + 8y^6 + 11y^5 + 5y^4 - 7y^3 - 9y^2 - 2y + 1$
c_2, c_4, c_8 c_9	$y^8 + 6y^7 + 15y^6 + 17y^5 + y^4 - 21y^3 - 24y^2 - 9y + 1$
c_3, c_6	$y^8 - 2y^7 - 9y^6 - 7y^5 + 5y^4 + 11y^3 + 8y^2 + 3y + 1$
c_7, c_{10}, c_{11}	$y^8 - 11y^7 + 49y^6 - 112y^5 + 134y^4 - 71y^3 + 3y^2 + 5y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.163169 + 0.915412I$ $a = 1.000040 + 0.736649I$ $b = -0.511162 + 1.035650I$	$-0.155635 - 0.787051I$	$-8.59786 - 1.33483I$
$u = 0.163169 - 0.915412I$ $a = 1.000040 - 0.736649I$ $b = -0.511162 - 1.035650I$	$-0.155635 + 0.787051I$	$-8.59786 + 1.33483I$
$u = 0.918626$ $a = -0.323992$ $b = -0.297628$	-2.98361	-12.1620
$u = -0.404913 + 1.017880I$ $a = -1.143500 + 0.110127I$ $b = 0.350924 - 1.208540I$	$5.21920 + 1.77211I$	$-2.23409 - 0.85548I$
$u = -0.404913 - 1.017880I$ $a = -1.143500 - 0.110127I$ $b = 0.350924 + 1.208540I$	$5.21920 - 1.77211I$	$-2.23409 + 0.85548I$
$u = -0.95744 + 1.12705I$ $a = 0.720153 - 0.424011I$ $b = -0.211625 + 1.217620I$	$1.24083 + 3.75870I$	$-10.69968 - 3.38204I$
$u = -0.95744 - 1.12705I$ $a = 0.720153 + 0.424011I$ $b = -0.211625 - 1.217620I$	$1.24083 - 3.75870I$	$-10.69968 + 3.38204I$
$u = 0.479751$ $a = 2.17061$ $b = 1.04135$	-12.9150	-12.7750

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

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

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

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

$$a_9 = \begin{pmatrix} a \\ \frac{5}{7}a^5u - \frac{5}{7}a^3u + \cdots - \frac{5}{7}a + \frac{1}{7} \end{pmatrix}$$

$$a_4 = \begin{pmatrix} a^2u \\ -\frac{3}{7}a^5u - \frac{4}{7}a^3u + \cdots + \frac{10}{7}a - \frac{2}{7} \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -\frac{3}{7}a^5u - \frac{4}{7}a^3u + \cdots + \frac{10}{7}a - \frac{2}{7} \\ -\frac{4}{7}a^5u - \frac{3}{7}a^3u + \cdots + \frac{11}{7}a + \frac{2}{7} \end{pmatrix}$$

$$a_8 = \begin{pmatrix} \frac{5}{7}a^5u - \frac{5}{7}a^3u + \cdots + \frac{2}{7}a + \frac{1}{7} \\ \frac{5}{7}a^5u - \frac{5}{7}a^3u + \cdots - \frac{5}{7}a + \frac{1}{7} \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} a^2u - 2u \\ \frac{3}{7}a^5u + \frac{4}{7}a^3u + \cdots - \frac{10}{7}a + \frac{2}{7} \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -\frac{2}{7}a^5u + a^4u + \cdots + \frac{2}{7}a + \frac{8}{7} \\ -a^4u - a^4 + a^3 + au + 2 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} a^3u + a^3 - a \\ -\frac{4}{7}a^5u - a^4u + \cdots + \frac{4}{7}a + \frac{2}{7} \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} a^3u + a^3 - a \\ -\frac{4}{7}a^5u - a^4u + \cdots + \frac{4}{7}a + \frac{2}{7} \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -4u - 14$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_5	$(u^2 - u + 1)^6$
c_2, c_4, c_8 c_9	$u^{12} - u^{11} + \cdots + 14u + 7$
c_3, c_6	$u^{12} - u^{11} + \cdots - 56u + 13$
c_7, c_{10}, c_{11}	$(u^3 - u^2 - 2u + 1)^4$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_5	$(y^2 + y + 1)^6$
c_2, c_4, c_8 c_9	$y^{12} + 3y^{11} + \cdots - 140y^2 + 49$
c_3, c_6	$y^{12} - 13y^{11} + \cdots - 432y + 169$
c_7, c_{10}, c_{11}	$(y^3 - 5y^2 + 6y - 1)^4$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.500000 + 0.866025I$ $a = -1.100660 + 0.111510I$ $b = \ \ 0.231240 - 1.394380I$	$4.22983 + 2.02988I$	$-12.00000 - 3.46410I$
$u = -0.500000 + 0.866025I$ $a = \ \ 1.091430 + 0.189362I$ $b = -1.61068 - 0.71000I$	$-12.68950 + 2.02988I$	$-12.00000 - 3.46410I$
$u = -0.500000 + 0.866025I$ $a = -1.045080 + 0.441811I$ $b = \ \ 0.763411 - 0.046058I$	$-1.40994 + 2.02988I$	$-12.00000 - 3.46410I$
$u = -0.500000 + 0.866025I$ $a = \ \ 0.421593 + 0.638105I$ $b = -0.139922 + 1.125970I$	$-1.40994 + 2.02988I$	$-12.00000 - 3.46410I$
$u = -0.500000 + 0.866025I$ $a = \ \ 1.323190 - 0.496928I$ $b = -0.453761 + 1.008960I$	$4.22983 + 2.02988I$	$-12.00000 - 3.46410I$
$u = -0.500000 + 0.866025I$ $a = -0.19046 - 1.74989I$ $b = \ \ 0.709707 - 0.850523I$	$-12.68950 + 2.02988I$	$-12.00000 - 3.46410I$
$u = -0.500000 - 0.866025I$ $a = -1.100660 - 0.111510I$ $b = \ \ 0.231240 + 1.394380I$	$4.22983 - 2.02988I$	$-12.00000 + 3.46410I$
$u = -0.500000 - 0.866025I$ $a = \ \ 1.091430 - 0.189362I$ $b = -1.61068 + 0.71000I$	$-12.68950 - 2.02988I$	$-12.00000 + 3.46410I$
$u = -0.500000 - 0.866025I$ $a = -1.045080 - 0.441811I$ $b = \ \ 0.763411 + 0.046058I$	$-1.40994 - 2.02988I$	$-12.00000 + 3.46410I$
$u = -0.500000 - 0.866025I$ $a = \ \ 0.421593 - 0.638105I$ $b = -0.139922 - 1.125970I$	$-1.40994 - 2.02988I$	$-12.00000 + 3.46410I$

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.500000-0.866025I$ $a=\ \ 1.323190+0.496928I$ $b=-0.453761-1.008960I$	$4.22983-2.02988I$	$-12.00000+3.46410I$
$u=-0.500000-0.866025I$ $a=-0.19046+1.74989I$ $b=\ \ 0.709707+0.850523I$	$-12.68950-2.02988I$	$-12.00000+3.46410I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u^2-u+1)^6(u^8+u^7+2u^6-u^5+u^4-3u^3+u^2-2u+1)$ $\cdot(u^{13}+8u^{12}+\cdots+56u+8)$
c_2, c_9	$(u^8+3u^6-u^5+3u^4-3u^3-3u-1)(u^{12}-u^{11}+\cdots+14u+7)$ $\cdot(u^{13}+3u^{11}+\cdots+2u+1)$
c_3, c_6	$(u^8+2u^7+\cdots-u+1)(u^{12}-u^{11}+\cdots-56u+13)$ $\cdot(u^{13}-2u^{12}+\cdots-4u+1)$
c_4, c_8	$(u^8+3u^6+u^5+3u^4+3u^3+3u-1)(u^{12}-u^{11}+\cdots+14u+7)$ $\cdot(u^{13}+3u^{11}+\cdots+2u+1)$
c_5	$(u^2-u+1)^6(u^8-u^7+2u^6+u^5+u^4+3u^3+u^2+2u+1)$ $\cdot(u^{13}+8u^{12}+\cdots+56u+8)$
c_7	$(u^3-u^2-2u+1)^4(u^8+u^7-5u^6-4u^5+8u^4+5u^3-3u^2-u-1)$ $\cdot(u^{13}+6u^{12}+\cdots+14u+4)$
c_{10}, c_{11}	$(u^3-u^2-2u+1)^4(u^8-u^7-5u^6+4u^5+8u^4-5u^3-3u^2+u-1)$ $\cdot(u^{13}+6u^{12}+\cdots+14u+4)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_5	$(y^2+y+1)^6(y^8+3y^7+8y^6+11y^5+5y^4-7y^3-9y^2-2y+1)$ $\cdot(y^{13}+4y^{12}+\cdots+480y-64)$
c_2, c_4, c_8 c_9	$(y^8+6y^7+15y^6+17y^5+y^4-21y^3-24y^2-9y+1)$ $\cdot(y^{12}+3y^{11}+\cdots-140y^2+49)(y^{13}+6y^{12}+\cdots+2y-1)$
c_3, c_6	$(y^8-2y^7-9y^6-7y^5+5y^4+11y^3+8y^2+3y+1)$ $\cdot(y^{12}-13y^{11}+\cdots-432y+169)(y^{13}-26y^{12}+\cdots+42y-1)$
c_7, c_{10}, c_{11}	$(y^3-5y^2+6y-1)^4$ $\cdot(y^8-11y^7+49y^6-112y^5+134y^4-71y^3+3y^2+5y+1)$ $\cdot(y^{13}-16y^{12}+\cdots+204y-16)$