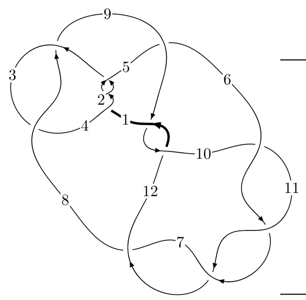
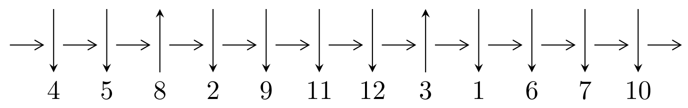
$12a_{0822}$ ($K12a_{0822}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle u^{64} - 34u^{62} + \cdots + b + u,\ -u^{63} + 34u^{61} + \cdots + a - 2,\ u^{65} + 2u^{64} + \cdots - u + 1\rangle$$
$$I_2^u = \langle u^5 - 2u^3 - u^2 + b + 1,\ u^5 - 3u^3 - u^2 + a + 2u + 2,\ u^6 - u^5 - 3u^4 + 2u^3 + 2u^2 + u - 1\rangle$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 71 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.

$$\boldsymbol{I^u_1 = \langle u^{64} - 34u^{62} + \cdots + b + u,\ -u^{63} + 34u^{61} + \cdots + a - 2,\ u^{65} + 2u^{64} + \cdots - u + 1\rangle}$$

(i) Arc colorings

$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} u^{63} - 34u^{61} + \cdots - 10u + 2 \\ -u^{64} + 34u^{62} + \cdots + 7u^2 - u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} u^{64} + u^{63} + \cdots - 12u + 3 \\ 2u^{64} + 2u^{63} + \cdots - 4u + 2 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -u^{11} + 6u^9 - 12u^7 + 8u^5 - u^3 + 2u \\ -u^{11} + 5u^9 - 8u^7 + 5u^5 - 3u^3 + u \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} u \\ u \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -u^2 + 1 \\ -u^2 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} u^{20} - 11u^{18} + \cdots - 3u^2 + 1 \\ u^{20} - 10u^{18} + 40u^{16} - 82u^{14} + 95u^{12} - 72u^{10} + 44u^8 - 18u^6 + 5u^4 - 2u^2 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} u^{64} + u^{63} + \cdots - 11u + 3 \\ u^{64} + u^{63} + \cdots - 2u + 1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -u^3 + 2u \\ -u^3 + u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^7 + 4u^5 - 4u^3 \\ -u^7 + 3u^5 - 2u^3 + u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 8u^{64} + 11u^{63} + \cdots - 22u - 6$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_4	$u^{65} - 7u^{64} + \cdots - 8u + 1$
c_3, c_8	$u^{65} + u^{64} + \cdots + 128u + 64$
c_5	$u^{65} + 2u^{64} + \cdots - 5425u - 1549$
c_6, c_7, c_{10} c_{11}	$u^{65} - 2u^{64} + \cdots - u - 1$
c_9, c_{12}	$u^{65} - 12u^{64} + \cdots + 69u + 73$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$y^{65} - 63y^{64} + \cdots + 52y - 1$
c_3, c_8	$y^{65} + 39y^{64} + \cdots + 12288y - 4096$
c_5	$y^{65} - 24y^{64} + \cdots + 86536059y - 2399401$
c_6, c_7, c_{10} c_{11}	$y^{65} - 72y^{64} + \cdots + 19y - 1$
c_9, c_{12}	$y^{65} + 36y^{64} + \cdots + 52795y - 5329$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.849078 + 0.151759I$		
$a = -0.52962 + 2.16096I$	$-10.18900 + 5.61738I$	$-17.6543 - 4.7770I$
$b = -0.290266 + 0.275339I$		
$u = -0.849078 - 0.151759I$		
$a = -0.52962 - 2.16096I$	$-10.18900 - 5.61738I$	$-17.6543 + 4.7770I$
$b = -0.290266 - 0.275339I$		
$u = 0.612809 + 0.581694I$		
$a = -2.23569 - 1.18411I$	$-5.66682 - 11.33370I$	$-12.3674 + 8.6652I$
$b = 0.116075 - 0.314062I$		
$u = 0.612809 - 0.581694I$		
$a = -2.23569 + 1.18411I$	$-5.66682 + 11.33370I$	$-12.3674 - 8.6652I$
$b = 0.116075 + 0.314062I$		
$u = 0.591829 + 0.558370I$		
$a = 2.06155 + 1.34040I$	$0.33245 - 7.21157I$	$-9.35363 + 8.77748I$
$b = -0.355492 + 0.274934I$		
$u = 0.591829 - 0.558370I$		
$a = 2.06155 - 1.34040I$	$0.33245 + 7.21157I$	$-9.35363 - 8.77748I$
$b = -0.355492 - 0.274934I$		
$u = 0.664359 + 0.450292I$		
$a = 1.56056 + 0.64097I$	$-8.31384 - 0.16938I$	$-15.5304 + 3.0150I$
$b = -0.296279 - 0.301108I$		
$u = 0.664359 - 0.450292I$		
$a = 1.56056 - 0.64097I$	$-8.31384 + 0.16938I$	$-15.5304 - 3.0150I$
$b = -0.296279 + 0.301108I$		
$u = -0.591992 + 0.536176I$		
$a = -0.33537 + 1.45599I$	$-2.33808 + 4.89491I$	$-11.39737 - 6.04524I$
$b = -0.242545 + 0.593048I$		
$u = -0.591992 - 0.536176I$		
$a = -0.33537 - 1.45599I$	$-2.33808 - 4.89491I$	$-11.39737 + 6.04524I$
$b = -0.242545 - 0.593048I$		

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.494585 + 0.625336I$ $a = 0.779520 + 0.719093I$ $b = 0.361458 + 0.362562I$	$-0.05575 + 2.11893I$	$-12.62240 - 3.49033I$
$u = -0.494585 - 0.625336I$ $a = 0.779520 - 0.719093I$ $b = 0.361458 - 0.362562I$	$-0.05575 - 2.11893I$	$-12.62240 + 3.49033I$
$u = 0.774602$ $a = 0.765459$ $b = -0.650676$	-5.70560	-17.2280
$u = -0.529854 + 0.558575I$ $a = 0.192170 - 0.901830I$ $b = 0.116273 - 0.391001I$	$2.87311 + 2.88923I$	$-3.42187 - 4.67269I$
$u = -0.529854 - 0.558575I$ $a = 0.192170 + 0.901830I$ $b = 0.116273 + 0.391001I$	$2.87311 - 2.88923I$	$-3.42187 + 4.67269I$
$u = 0.573094 + 0.509493I$ $a = -1.56952 - 1.35973I$ $b = 0.564918 + 0.034458I$	$-0.92967 - 2.31652I$	$-12.22093 + 3.86577I$
$u = 0.573094 - 0.509493I$ $a = -1.56952 + 1.35973I$ $b = 0.564918 - 0.034458I$	$-0.92967 + 2.31652I$	$-12.22093 - 3.86577I$
$u = -0.761928 + 0.069316I$ $a = 0.34486 - 2.57712I$ $b = 0.144740 - 0.449027I$	$-3.63927 + 2.31291I$	$-16.5119 - 4.5602I$
$u = -0.761928 - 0.069316I$ $a = 0.34486 + 2.57712I$ $b = 0.144740 + 0.449027I$	$-3.63927 - 2.31291I$	$-16.5119 + 4.5602I$
$u = -0.444280 + 0.563851I$ $a = -0.979188 + 0.166649I$ $b = -0.439103 + 0.089481I$	$3.12509 + 0.97162I$	$-2.56463 - 3.01871I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.444280 - 0.563851I$ $a = -0.979188 - 0.166649I$ $b = -0.439103 - 0.089481I$	$3.12509 - 0.97162I$	$-2.56463 + 3.01871I$
$u = 0.345558 + 0.625959I$ $a = 0.597480 + 0.424044I$ $b = 0.26840 + 1.44188I$	$-4.88166 + 7.23122I$	$-10.46990 - 2.83323I$
$u = 0.345558 - 0.625959I$ $a = 0.597480 - 0.424044I$ $b = 0.26840 - 1.44188I$	$-4.88166 - 7.23122I$	$-10.46990 + 2.83323I$
$u = 0.360635 + 0.581410I$ $a = -0.519658 + 0.056262I$ $b = -0.363851 - 1.310020I$	$1.00659 + 3.30244I$	$-7.13975 - 2.59787I$
$u = 0.360635 - 0.581410I$ $a = -0.519658 - 0.056262I$ $b = -0.363851 + 1.310020I$	$1.00659 - 3.30244I$	$-7.13975 + 2.59787I$
$u = -0.347239 + 0.544294I$ $a = 1.54475 - 0.29359I$ $b = 0.667710 - 0.250220I$	$-1.63173 - 1.15310I$	$-8.96204 - 0.62633I$
$u = -0.347239 - 0.544294I$ $a = 1.54475 + 0.29359I$ $b = 0.667710 + 0.250220I$	$-1.63173 + 1.15310I$	$-8.96204 + 0.62633I$
$u = 0.397848 + 0.479108I$ $a = -0.152635 - 0.791660I$ $b = 0.493556 + 0.869041I$	$-0.383917 - 1.172590I$	$-10.77474 + 3.53972I$
$u = 0.397848 - 0.479108I$ $a = -0.152635 + 0.791660I$ $b = 0.493556 - 0.869041I$	$-0.383917 + 1.172590I$	$-10.77474 - 3.53972I$
$u = -1.40989 + 0.11554I$ $a = -0.085739 - 0.727029I$ $b = -0.963524 - 0.159703I$	$-10.37080 - 4.63328I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -1.40989 - 0.11554I$ $a = -0.085739 + 0.727029I$ $b = -0.963524 + 0.159703I$	$-10.37080 + 4.63328I$	0
$u = 0.163296 + 0.550521I$ $a = 0.765667 - 0.368871I$ $b = 0.216553 - 1.080350I$	$-6.83780 - 3.22697I$	$-11.27004 + 3.16299I$
$u = 0.163296 - 0.550521I$ $a = 0.765667 + 0.368871I$ $b = 0.216553 + 1.080350I$	$-6.83780 + 3.22697I$	$-11.27004 - 3.16299I$
$u = 0.544767$ $a = -0.440631$ $b = 0.243537$	-0.894856	-10.6250
$u = -1.46159 + 0.10569I$ $a = 0.181952 + 0.962693I$ $b = 1.16904 + 1.01325I$	$-4.78459 - 1.02708I$	0
$u = -1.46159 - 0.10569I$ $a = 0.181952 - 0.962693I$ $b = 1.16904 - 1.01325I$	$-4.78459 + 1.02708I$	0
$u = 1.49086 + 0.09279I$ $a = -0.707400 - 0.841672I$ $b = -2.22656 - 1.64975I$	$-7.55431 - 0.79217I$	0
$u = 1.49086 - 0.09279I$ $a = -0.707400 + 0.841672I$ $b = -2.22656 + 1.64975I$	$-7.55431 + 0.79217I$	0
$u = 1.50040 + 0.14327I$ $a = 0.388062 + 0.569649I$ $b = 1.27751 + 0.96561I$	$-3.25528 - 3.41758I$	0
$u = 1.50040 - 0.14327I$ $a = 0.388062 - 0.569649I$ $b = 1.27751 - 0.96561I$	$-3.25528 + 3.41758I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.51289+0.11377I$ $a=\quad 0.01624-1.55519I$ $b=-0.88043-2.69896I$	$-6.78772+3.13550I$	0
$u=-1.51289-0.11377I$ $a=\quad 0.01624+1.55519I$ $b=-0.88043+2.69896I$	$-6.78772-3.13550I$	0
$u=\quad 1.50743+0.18519I$ $a=-0.660901-0.183350I$ $b=-1.47488+0.16745I$	$-6.61480-5.02407I$	0
$u=\quad 1.50743-0.18519I$ $a=-0.660901+0.183350I$ $b=-1.47488-0.16745I$	$-6.61480+5.02407I$	0
$u=\quad 1.53689+0.16083I$ $a=\quad 0.347709-0.503738I$ $b=\quad 0.381409-1.252670I$	$-3.99527-5.46572I$	0
$u=\quad 1.53689-0.16083I$ $a=\quad 0.347709+0.503738I$ $b=\quad 0.381409+1.252670I$	$-3.99527+5.46572I$	0
$u=-1.55420$ $a=\quad 0.565237$ $b=\quad 0.840718$	-8.08338	0
$u=-1.55791+0.14949I$ $a=\quad 1.11591-2.21291I$ $b=\quad 1.77120-4.71029I$	$-8.07881+4.70967I$	0
$u=-1.55791-0.14949I$ $a=\quad 1.11591+2.21291I$ $b=\quad 1.77120+4.71029I$	$-8.07881-4.70967I$	0
$u=-1.56117+0.16671I$ $a=-1.34382+2.19591I$ $b=-2.54714+4.80810I$	$-6.86256+9.85745I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.56117 - 0.16671I$ $a = -1.34382 - 2.19591I$ $b = -2.54714 - 4.80810I$	$-6.86256 - 9.85745I$	0
$u = 1.56229 + 0.15874I$ $a = -0.629847 + 0.881225I$ $b = -0.75213 + 2.10739I$	$-9.55235 - 7.42892I$	0
$u = 1.56229 - 0.15874I$ $a = -0.629847 - 0.881225I$ $b = -0.75213 - 2.10739I$	$-9.55235 + 7.42892I$	0
$u = -1.56850 + 0.17675I$ $a = 1.36052 - 2.11880I$ $b = 2.79633 - 4.55461I$	$-12.9536 + 14.1196I$	0
$u = -1.56850 - 0.17675I$ $a = 1.36052 + 2.11880I$ $b = 2.79633 + 4.55461I$	$-12.9536 - 14.1196I$	0
$u = -1.58211 + 0.12862I$ $a = -1.21036 + 1.81529I$ $b = -2.00477 + 3.54223I$	$-15.8923 + 2.2931I$	0
$u = -1.58211 - 0.12862I$ $a = -1.21036 - 1.81529I$ $b = -2.00477 - 3.54223I$	$-15.8923 - 2.2931I$	0
$u = 1.59363 + 0.01214I$ $a = -0.09196 - 2.88914I$ $b = -0.32386 - 6.15827I$	$-11.62670 - 2.56811I$	0
$u = 1.59363 - 0.01214I$ $a = -0.09196 + 2.88914I$ $b = -0.32386 + 6.15827I$	$-11.62670 + 2.56811I$	0
$u = -1.59618$ $a = -1.28300$ $b = -2.03922$	-13.7436	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.220404 + 0.332017I$ $a = -0.864656 - 0.515239I$ $b = -0.008971 + 0.638980I$	$-0.505584 - 0.990498I$	$-8.02418 + 6.33094I$
$u = 0.220404 - 0.332017I$ $a = -0.864656 + 0.515239I$ $b = -0.008971 - 0.638980I$	$-0.505584 + 0.990498I$	$-8.02418 - 6.33094I$
$u = 1.61071 + 0.02844I$ $a = 0.00288 + 2.74367I$ $b = 0.26375 + 5.67324I$	$-18.5211 - 6.1970I$	0
$u = 1.61071 - 0.02844I$ $a = 0.00288 - 2.74367I$ $b = 0.26375 - 5.67324I$	$-18.5211 + 6.1970I$	0
$u = -0.287026$ $a = 3.70600$ $b = 0.727372$	-2.04090	0.885750

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -3u^5+u^4+14u^3-u^2-14u-18$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$(y-1)^6$
c_3, c_8	y^6
c_5, c_9, c_{12}	$y^6+5y^5+9y^4+4y^3-6y^2-5y+1$
c_6, c_7, c_{10} c_{11}	$y^6-7y^5+17y^4-16y^3+6y^2-5y+1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.493180 + 0.575288I$ $a = -0.089969 - 0.799962I$ $b = -0.446039 + 0.121233I$	$1.31531 + 1.97241I$	$-6.43930 - 3.48596I$
$u = -0.493180 - 0.575288I$ $a = -0.089969 + 0.799962I$ $b = -0.446039 - 0.121233I$	$1.31531 - 1.97241I$	$-6.43930 + 3.48596I$
$u = 0.483672$ $a = -2.42043$ $b = -0.566232$	-2.38379	-23.4460
$u = 1.52087 + 0.16310I$ $a = 0.227586 - 0.710576I$ $b = 0.87287 - 1.51178I$	$-5.34051 - 4.59213I$	$-10.66600 + 2.48468I$
$u = 1.52087 - 0.16310I$ $a = 0.227586 + 0.710576I$ $b = 0.87287 + 1.51178I$	$-5.34051 + 4.59213I$	$-10.66600 - 2.48468I$
$u = -1.53904$ $a = 1.14519$ $b = 2.71257$	-9.30502	-18.3430

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_2	$((u-1)^6)(u^{65} - 7u^{64} + \cdots - 8u + 1)$
c_3, c_8	$u^6(u^{65} + u^{64} + \cdots + 128u + 64)$
c_4	$((u+1)^6)(u^{65} - 7u^{64} + \cdots - 8u + 1)$
c_5	$(u^6 + u^5 + 3u^4 + 2u^3 + 2u^2 + u - 1)(u^{65} + 2u^{64} + \cdots - 5425u - 1549)$
c_6, c_7	$(u^6 - u^5 - 3u^4 + 2u^3 + 2u^2 + u - 1)(u^{65} - 2u^{64} + \cdots - u - 1)$
c_9	$(u^6 + u^5 + 3u^4 + 2u^3 + 2u^2 + u - 1)(u^{65} - 12u^{64} + \cdots + 69u + 73)$
c_{10}, c_{11}	$(u^6 + u^5 - 3u^4 - 2u^3 + 2u^2 - u - 1)(u^{65} - 2u^{64} + \cdots - u - 1)$
c_{12}	$(u^6 - u^5 + 3u^4 - 2u^3 + 2u^2 - u - 1)(u^{65} - 12u^{64} + \cdots + 69u + 73)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$((y-1)^6)(y^{65} - 63y^{64} + \cdots + 52y - 1)$
c_3, c_8	$y^6(y^{65} + 39y^{64} + \cdots + 12288y - 4096)$
c_5	$(y^6 + 5y^5 + 9y^4 + 4y^3 - 6y^2 - 5y + 1)$ $\cdot\,(y^{65} - 24y^{64} + \cdots + 86536059y - 2399401)$
c_6, c_7, c_{10} c_{11}	$(y^6 - 7y^5 + \cdots - 5y + 1)(y^{65} - 72y^{64} + \cdots + 19y - 1)$
c_9, c_{12}	$(y^6 + 5y^5 + 9y^4 + 4y^3 - 6y^2 - 5y + 1)$ $\cdot\,(y^{65} + 36y^{64} + \cdots + 52795y - 5329)$