# OpenGeoProver Output for conjecture "geothm_zadatak"

Wu's method used

October 1, 2016

## 1 Invoking the theorem prover

The used proving method is Wu's method.
The input system is:

$$
\begin{aligned}
p_1 &= 2x_1 - \\
p_2 &= 2x_2 - \\
p_3 &= 2x_4 - \\
p_4 &= 2x_5 - x_1 - \\
p_5 &= 2x_6 - x_2 \\
p_6 &= 2x_7 - x_3 \\
p_7 &= x_{11}x_2 + x_9 - x_2 \\
p_8 &= x_{11}x_3 + x_{10} - x_3 \\
p_9 &= -x_{12}x_5 + x_8 \\
p_{10} &= -x_{12}x_6 + x_9 \\
p_{11} &= -x_{12}x_7 + x_{10} \\
p_{12} &= 2x_{13} - 2 \\
p_{13} &= 2x_{14} - \\
p_{14} &= -x_{18}x_{14} + x_{18}x_2 + x_{16} - x_2 \\
p_{15} &= x_{18}x_3 + x_{17} - x_3 \\
p_{16} &= -x_{19}x_5 + x_{19} + x_{15} - \\
p_{17} &= -x_{19}x_6 + x_{19} + x_{16} - \\
p_{18} &= -x_{19}x_7 + x_{17} \\
p_{19} &= 2x_{20} - \\
p_{20} &= 2x_{21} - 2 \\
p_{21} &= 2x_{22} - x_1 - \\
p_{22} &= 2x_{23} - x_2 - \\
p_{23} &= 2x_{24} - x_3 \\
p_{24} &= -x_{28}x_{23} + x_{28} + x_{26} - \\
p_{25} &= -x_{28}x_{24} + x_{27}
\end{aligned}
$$

$$
\begin{aligned}
p_{26} &= -x_{29}x_{20} + x_{29}x_1 + x_{25} - x_1 \\
p_{27} &= -x_{29}x_{21} + x_{29}x_2 + x_{26} - x_2 \\
p_{28} &= x_{29}x_3 + x_{27} - x_3 \\
p_{29} &= x_{30} - \\
p_{30} &= x_{31} - x_{27}x_{16} + x_{27}x_9 + x_{26}x_{17} - x_{26}x_{10} - x_{17}x_9 + x_{16}x_{10} \\
p_{31} &= x_{32} + x_{27}x_{15} - x_{27}x_8 - x_{25}x_{17} + x_{25}x_{10} + x_{17}x_8 - x_{15}x_{10} \\
p_{32} &= x_{33} - x_{26}x_{15} + x_{26}x_8 + x_{25}x_{16} - x_{25}x_9 - x_{16}x_8 + x_{15}x_9 \\
p_{33} &= x_{34} + x_{33}x_{10} + x_{32}x_9 + x_{31}x_8 \\
p_{34} &= x_{35} - x_1 \\
p_{35} &= x_{36} - x_2 \\
p_{36} &= -x_{38}x_{30} + x_{37} - x_3 \\
p_{37} &= x_{37}x_{30} \\
p_{38} &= x_{39} - x_1 \\
p_{39} &= x_{40} - x_2 \\
p_{40} &= -x_{42}x_{30} + x_{41} - x_3 \\
p_{41} &= x_{41}x_{33} + x_{40}x_{32} + x_{39}x_{31} + x_{34}
\end{aligned}
$$

## 1.1 Triangulation, step 1

**Choosing variable:** Trying the variable with index 41.

**Variable $x_{41}$ selected:** The number of polynomials with this variable, with indexes from 1 to 41, is 2.

**Minimal degrees:** 2 polynomial(s) with degree 1.

**Polynomial with linear degree:** Removing variable $x_{41}$ from all other polynomials by reducing them with polynomial $p_{40}$ from previous step.

Finished a triangulation step, the current system is:

$$
\begin{aligned}
p_1 &= 2x_1 - \\
p_2 &= 2x_2 - \\
p_3 &= 2x_4 - \\
p_4 &= 2x_5 - x_1 - \\
p_5 &= 2x_6 - x_2 \\
p_6 &= 2x_7 - x_3 \\
p_7 &= x_{11}x_2 + x_9 - x_2 \\
p_8 &= x_{11}x_3 + x_{10} - x_3 \\
p_9 &= -x_{12}x_5 + x_8 \\
p_{10} &= -x_{12}x_6 + x_9 \\
p_{11} &= -x_{12}x_7 + x_{10} \\
p_{12} &= 2x_{13} - 2 \\
p_{13} &= 2x_{14} -
\end{aligned}
$$

$$
\begin{aligned}
p_{14} &= -x_{18}x_{14} + x_{18}x_2 + x_{16} - x_2 \\
p_{15} &= x_{18}x_3 + x_{17} - x_3 \\
p_{16} &= -x_{19}x_5 + x_{19} + x_{15} - \\
p_{17} &= -x_{19}x_6 + x_{19} + x_{16} - \\
p_{18} &= -x_{19}x_7 + x_{17} \\
p_{19} &= 2x_{20} - \\
p_{20} &= 2x_{21} - 2 \\
p_{21} &= 2x_{22} - x_1 - \\
p_{22} &= 2x_{23} - x_2 - \\
p_{23} &= 2x_{24} - x_3 \\
p_{24} &= -x_{28}x_{23} + x_{28} + x_{26} - \\
p_{25} &= -x_{28}x_{24} + x_{27} \\
p_{26} &= -x_{29}x_{20} + x_{29}x_1 + x_{25} - x_1 \\
p_{27} &= -x_{29}x_{21} + x_{29}x_2 + x_{26} - x_2 \\
p_{28} &= x_{29}x_3 + x_{27} - x_3 \\
p_{29} &= x_{30} - \\
p_{30} &= x_{31} - x_{27}x_{16} + x_{27}x_9 + x_{26}x_{17} - x_{26}x_{10} - x_{17}x_9 + x_{16}x_{10} \\
p_{31} &= x_{32} + x_{27}x_{15} - x_{27}x_8 - x_{25}x_{17} + x_{25}x_{10} + x_{17}x_8 - x_{15}x_{10} \\
p_{32} &= x_{33} - x_{26}x_{15} + x_{26}x_8 + x_{25}x_{16} - x_{25}x_9 - x_{16}x_8 + x_{15}x_9 \\
p_{33} &= x_{34} + x_{33}x_{10} + x_{32}x_9 + x_{31}x_8 \\
p_{34} &= x_{35} - x_1 \\
p_{35} &= x_{36} - x_2 \\
p_{36} &= -x_{38}x_{30} + x_{37} - x_3 \\
p_{37} &= x_{37}x_{30} \\
p_{38} &= x_{39} - x_1 \\
p_{39} &= x_{40} - x_2 \\
p_{40} &= x_{42}x_{33}x_{30} + x_{40}x_{32} + x_{39}x_{31} + x_{34} + x_{33}x_3 \\
p_{41} &= -x_{42}x_{30} + x_{41} - x_3
\end{aligned}
$$

## 1.2 Triangulation, step 2

**Choosing variable:** Trying the variable with index 40.

**Variable $x_{40}$ selected:** The number of polynomials with this variable, with indexes from 1 to 40, is 2.

**Minimal degrees:** 2 polynomial(s) with degree 1.

**Polynomial with linear degree:** Removing variable $x_{40}$ from all other polynomials by reducing them with polynomial $p_{39}$ from previous step.

Finished a triangulation step, the current system is:

$$
\begin{aligned}
p_1 &= 2x_1 - \\
\end{aligned}
$$

$$
\begin{aligned}
p_{2} &= 2x_{2} - \\
p_{3} &= 2x_{4} - \\
p_{4} &= 2x_{5} - x_{1} - \\
p_{5} &= 2x_{6} - x_{2} \\
p_{6} &= 2x_{7} - x_{3} \\
p_{7} &= x_{11}x_{2} + x_{9} - x_{2} \\
p_{8} &= x_{11}x_{3} + x_{10} - x_{3} \\
p_{9} &= -x_{12}x_{5} + x_{8} \\
p_{10} &= -x_{12}x_{6} + x_{9} \\
p_{11} &= -x_{12}x_{7} + x_{10} \\
p_{12} &= 2x_{13} - 2 \\
p_{13} &= 2x_{14} - \\
p_{14} &= -x_{18}x_{14} + x_{18}x_{2} + x_{16} - x_{2} \\
p_{15} &= x_{18}x_{3} + x_{17} - x_{3} \\
p_{16} &= -x_{19}x_{5} + x_{19} + x_{15} - \\
p_{17} &= -x_{19}x_{6} + x_{19} + x_{16} - \\
p_{18} &= -x_{19}x_{7} + x_{17} \\
p_{19} &= 2x_{20} - \\
p_{20} &= 2x_{21} - 2 \\
p_{21} &= 2x_{22} - x_{1} - \\
p_{22} &= 2x_{23} - x_{2} - \\
p_{23} &= 2x_{24} - x_{3} \\
p_{24} &= -x_{28}x_{23} + x_{28} + x_{26} - \\
p_{25} &= -x_{28}x_{24} + x_{27} \\
p_{26} &= -x_{29}x_{20} + x_{29}x_{1} + x_{25} - x_{1} \\
p_{27} &= -x_{29}x_{21} + x_{29}x_{2} + x_{26} - x_{2} \\
p_{28} &= x_{29}x_{3} + x_{27} - x_{3} \\
p_{29} &= x_{30} - \\
p_{30} &= x_{31} - x_{27}x_{16} + x_{27}x_{9} + x_{26}x_{17} - x_{26}x_{10} - x_{17}x_{9} + x_{16}x_{10} \\
p_{31} &= x_{32} + x_{27}x_{15} - x_{27}x_{8} - x_{25}x_{17} + x_{25}x_{10} + x_{17}x_{8} - x_{15}x_{10} \\
p_{32} &= x_{33} - x_{26}x_{15} + x_{26}x_{8} + x_{25}x_{16} - x_{25}x_{9} - x_{16}x_{8} + x_{15}x_{9} \\
p_{33} &= x_{34} + x_{33}x_{10} + x_{32}x_{9} + x_{31}x_{8} \\
p_{34} &= x_{35} - x_{1} \\
p_{35} &= x_{36} - x_{2} \\
p_{36} &= -x_{38}x_{30} + x_{37} - x_{3} \\
p_{37} &= x_{37}x_{30} \\
p_{38} &= x_{39} - x_{1} \\
p_{39} &= x_{42}x_{33}x_{30} + x_{39}x_{31} + x_{34} + x_{33}x_{3} + x_{32}x_{2} \\
p_{40} &= x_{40} - x_{2} \\
p_{41} &= -x_{42}x_{30} + x_{41} - x_{3}
\end{aligned}
$$

## 1.3 Triangulation, step 3

**Choosing variable:** Trying the variable with index 39.

**Variable $x_{39}$ selected:** The number of polynomials with this variable, with indexes from 1 to 39, is 2.

**Minimal degrees:** 2 polynomial(s) with degree 1.

**Polynomial with linear degree:** Removing variable $x_{39}$ from all other polynomials by reducing them with polynomial $p_{38}$ from previous step.

Finished a triangulation step, the current system is:

$$
\begin{aligned}
p_1 &= 2x_1 - \\
p_2 &= 2x_2 - \\
p_3 &= 2x_4 - \\
p_4 &= 2x_5 - x_1 - \\
p_5 &= 2x_6 - x_2 \\
p_6 &= 2x_7 - x_3 \\
p_7 &= x_{11}x_2 + x_9 - x_2 \\
p_8 &= x_{11}x_3 + x_{10} - x_3 \\
p_9 &= -x_{12}x_5 + x_8 \\
p_{10} &= -x_{12}x_6 + x_9 \\
p_{11} &= -x_{12}x_7 + x_{10} \\
p_{12} &= 2x_{13} - 2 \\
p_{13} &= 2x_{14} - \\
p_{14} &= -x_{18}x_{14} + x_{18}x_2 + x_{16} - x_2 \\
p_{15} &= x_{18}x_3 + x_{17} - x_3 \\
p_{16} &= -x_{19}x_5 + x_{19} + x_{15} - \\
p_{17} &= -x_{19}x_6 + x_{19} + x_{16} - \\
p_{18} &= -x_{19}x_7 + x_{17} \\
p_{19} &= 2x_{20} - \\
p_{20} &= 2x_{21} - 2 \\
p_{21} &= 2x_{22} - x_1 - \\
p_{22} &= 2x_{23} - x_2 - \\
p_{23} &= 2x_{24} - x_3 \\
p_{24} &= -x_{28}x_{23} + x_{28} + x_{26} - \\
p_{25} &= -x_{28}x_{24} + x_{27} \\
p_{26} &= -x_{29}x_{20} + x_{29}x_1 + x_{25} - x_1 \\
p_{27} &= -x_{29}x_{21} + x_{29}x_2 + x_{26} - x_2 \\
p_{28} &= x_{29}x_3 + x_{27} - x_3 \\
p_{29} &= x_{30} - \\
p_{30} &= x_{31} - x_{27}x_{16} + x_{27}x_9 + x_{26}x_{17} - x_{26}x_{10} - x_{17}x_9 + x_{16}x_{10}
\end{aligned}
$$

$$
\begin{aligned}
p_{31} &= x_{32} + x_{27}x_{15} - x_{27}x_8 - x_{25}x_{17} + x_{25}x_{10} + x_{17}x_8 - x_{15}x_{10} \\
p_{32} &= x_{33} - x_{26}x_{15} + x_{26}x_8 + x_{25}x_{16} - x_{25}x_9 - x_{16}x_8 + x_{15}x_9 \\
p_{33} &= x_{34} + x_{33}x_{10} + x_{32}x_9 + x_{31}x_8 \\
p_{34} &= x_{35} - x_1 \\
p_{35} &= x_{36} - x_2 \\
p_{36} &= -x_{38}x_{30} + x_{37} - x_3 \\
p_{37} &= x_{37}x_{30} \\
p_{38} &= x_{42}x_{33}x_{30} + x_{34} + x_{33}x_3 + x_{32}x_2 + x_{31}x_1 \\
p_{39} &= x_{39} - x_1 \\
p_{40} &= x_{40} - x_2 \\
p_{41} &= -x_{42}x_{30} + x_{41} - x_3
\end{aligned}
$$

## 1.4 Triangulation, step 4

**Choosing variable:** Trying the variable with index 38.

**Variable $x_{38}$ selected:** The number of polynomials with this variable, with indexes from 1 to 38, is 1.

**Single polynomial with chosen variable:** Chosen polynomial is $p_{36}$. No reduction needed.

The triangular system has not been changed.

## 1.5 Triangulation, step 5

**Choosing variable:** Trying the variable with index 37.

**Variable $x_{37}$ selected:** The number of polynomials with this variable, with indexes from 1 to 37, is 1.

**Single polynomial with chosen variable:** Chosen polynomial is $p_{36}$. No reduction needed.

The triangular system has not been changed.

## 1.6 Triangulation, step 6

**Choosing variable:** Trying the variable with index 36.

**Variable $x_{36}$ selected:** The number of polynomials with this variable, with indexes from 1 to 36, is 1.

**Single polynomial with chosen variable:** Chosen polynomial is $p_{35}$. No reduction needed.

The triangular system has not been changed.

## 1.7 Triangulation, step 7

**Choosing variable:** Trying the variable with index 35.

**Variable $x_{35}$ selected:** The number of polynomials with this variable, with indexes from 1 to 35, is 1.

**Single polynomial with chosen variable:** Chosen polynomial is $p_{34}$. No reduction needed.

The triangular system has not been changed.

## 1.8 Triangulation, step 8

**Choosing variable:** Trying the variable with index 34.

**Variable $x_{34}$ selected:** The number of polynomials with this variable, with indexes from 1 to 34, is 2.

**Minimal degrees:** 2 polynomial(s) with degree 1.

**Polynomial with linear degree:** Removing variable $x_{34}$ from all other polynomials by reducing them with polynomial $p_{33}$ from previous step.

Finished a triangulation step, the current system is:

$$
\begin{aligned}
p_1 &= 2x_1 - \\
p_2 &= 2x_2 - \\
p_3 &= 2x_4 - \\
p_4 &= 2x_5 - x_1 - \\
p_5 &= 2x_6 - x_2 \\
p_6 &= 2x_7 - x_3 \\
p_7 &= x_{11}x_2 + x_9 - x_2 \\
p_8 &= x_{11}x_3 + x_{10} - x_3 \\
p_9 &= -x_{12}x_5 + x_8 \\
p_{10} &= -x_{12}x_6 + x_9 \\
p_{11} &= -x_{12}x_7 + x_{10} \\
p_{12} &= 2x_{13} - 2 \\
p_{13} &= 2x_{14} - \\
p_{14} &= -x_{18}x_{14} + x_{18}x_2 + x_{16} - x_2 \\
p_{15} &= x_{18}x_3 + x_{17} - x_3 \\
p_{16} &= -x_{19}x_5 + x_{19} + x_{15} - \\
p_{17} &= -x_{19}x_6 + x_{19} + x_{16} - \\
p_{18} &= -x_{19}x_7 + x_{17} \\
p_{19} &= 2x_{20} - \\
p_{20} &= 2x_{21} - 2 \\
p_{21} &= 2x_{22} - x_1 -
\end{aligned}
$$

$$
\begin{aligned}
p_{22} &= 2x_{23} - x_2 - \\
p_{23} &= 2x_{24} - x_3 \\
p_{24} &= -x_{28}x_{23} + x_{28} + x_{26} - \\
p_{25} &= -x_{28}x_{24} + x_{27} \\
p_{26} &= -x_{29}x_{20} + x_{29}x_1 + x_{25} - x_1 \\
p_{27} &= -x_{29}x_{21} + x_{29}x_2 + x_{26} - x_2 \\
p_{28} &= x_{29}x_3 + x_{27} - x_3 \\
p_{29} &= x_{30} - \\
p_{30} &= x_{31} - x_{27}x_{16} + x_{27}x_9 + x_{26}x_{17} - x_{26}x_{10} - x_{17}x_9 + x_{16}x_{10} \\
p_{31} &= x_{32} + x_{27}x_{15} - x_{27}x_8 - x_{25}x_{17} + x_{25}x_{10} + x_{17}x_8 - x_{15}x_{10} \\
p_{32} &= x_{33} - x_{26}x_{15} + x_{26}x_8 + x_{25}x_{16} - x_{25}x_9 - x_{16}x_8 + x_{15}x_9 \\
p_{33} &= x_{42}x_{33}x_{30} - x_{33}x_{10} + x_{33}x_3 - x_{32}x_9 + x_{32}x_2 - x_{31}x_8 + x_{31}x_1 \\
p_{34} &= x_{34} + x_{33}x_{10} + x_{32}x_9 + x_{31}x_8 \\
p_{35} &= x_{35} - x_1 \\
p_{36} &= x_{36} - x_2 \\
p_{37} &= x_{37}x_{30} \\
p_{38} &= -x_{38}x_{30} + x_{37} - x_3 \\
p_{39} &= x_{39} - x_1 \\
p_{40} &= x_{40} - x_2 \\
p_{41} &= -x_{42}x_{30} + x_{41} - x_3
\end{aligned}
$$

## 1.9 Triangulation, step 9

**Choosing variable:** Trying the variable with index 33.

**Variable $x_{33}$ selected:** The number of polynomials with this variable, with indexes from 1 to 33, is 2.

**Minimal degrees:** 2 polynomial(s) with degree 1.

**Polynomial with linear degree:** Removing variable $x_{33}$ from all other polynomials by reducing them with polynomial $p_{32}$ from previous step.

Finished a triangulation step, the current system is:

$$
\begin{aligned}
p_1 &= 2x_1 - \\
p_2 &= 2x_2 - \\
p_3 &= 2x_4 - \\
p_4 &= 2x_5 - x_1 - \\
p_5 &= 2x_6 - x_2 \\
p_6 &= 2x_7 - x_3 \\
p_7 &= x_{11}x_2 + x_9 - x_2 \\
p_8 &= x_{11}x_3 + x_{10} - x_3 \\
p_9 &= -x_{12}x_5 + x_8
\end{aligned}
$$

$$
\begin{aligned}
p_{10} &= -x_{12}x_6 + x_9 \\
p_{11} &= -x_{12}x_7 + x_{10} \\
p_{12} &= 2x_{13} - 2 \\
p_{13} &= 2x_{14} - \\
p_{14} &= -x_{18}x_{14} + x_{18}x_2 + x_{16} - x_2 \\
p_{15} &= x_{18}x_3 + x_{17} - x_3 \\
p_{16} &= -x_{19}x_5 + x_{19} + x_{15} - \\
p_{17} &= -x_{19}x_6 + x_{19} + x_{16} - \\
p_{18} &= -x_{19}x_7 + x_{17} \\
p_{19} &= 2x_{20} - \\
p_{20} &= 2x_{21} - 2 \\
p_{21} &= 2x_{22} - x_1 - \\
p_{22} &= 2x_{23} - x_2 - \\
p_{23} &= 2x_{24} - x_3 \\
p_{24} &= -x_{28}x_{23} + x_{28} + x_{26} - \\
p_{25} &= -x_{28}x_{24} + x_{27} \\
p_{26} &= -x_{29}x_{20} + x_{29}x_1 + x_{25} - x_1 \\
p_{27} &= -x_{29}x_{21} + x_{29}x_2 + x_{26} - x_2 \\
p_{28} &= x_{29}x_3 + x_{27} - x_3 \\
p_{29} &= x_{30} - \\
p_{30} &= x_{31} - x_{27}x_{16} + x_{27}x_9 + x_{26}x_{17} - x_{26}x_{10} - x_{17}x_9 + x_{16}x_{10} \\
p_{31} &= x_{32} + x_{27}x_{15} - x_{27}x_8 - x_{25}x_{17} + x_{25}x_{10} + x_{17}x_8 - x_{15}x_{10} \\
p_{32} &= x_{42}x_{30}x_{26}x_{15} - x_{42}x_{30}x_{26}x_8 - x_{42}x_{30}x_{25}x_{16} + \\
&\quad x_{42}x_{30}x_{25}x_9 + x_{42}x_{30}x_{16}x_8 - x_{42}x_{30}x_{15}x_9 - x_{32}x_9 + \\
&\quad x_{32}x_2 - x_{31}x_8 + x_{31}x_1 - x_{26}x_{15}x_{10} + x_{26}x_{15}x_3 + x_{26}x_{10}x_8 \\
&\quad -x_{26}x_8x_3 + x_{25}x_{16}x_{10} - x_{25}x_{16}x_3 - x_{25}x_{10}x_9 + x_{25}x_9x_3 \\
&\quad -x_{16}x_{10}x_8 + x_{16}x_8x_3 + x_{15}x_{10}x_9 - x_{15}x_9x_3 \\
p_{33} &= x_{33} - x_{26}x_{15} + x_{26}x_8 + x_{25}x_{16} - x_{25}x_9 - x_{16}x_8 + x_{15}x_9 \\
p_{34} &= x_{34} + x_{33}x_{10} + x_{32}x_9 + x_{31}x_8 \\
p_{35} &= x_{35} - x_1 \\
p_{36} &= x_{36} - x_2 \\
p_{37} &= x_{37}x_{30} \\
p_{38} &= -x_{38}x_{30} + x_{37} - x_3 \\
p_{39} &= x_{39} - x_1 \\
p_{40} &= x_{40} - x_2 \\
p_{41} &= -x_{42}x_{30} + x_{41} - x_3
\end{aligned}
$$

## 1.10 Triangulation, step 10

**Choosing variable:** Trying the variable with index 32.

**Variable $x_{32}$ selected:** The number of polynomials with this variable, with indexes from 1 to 32, is 2.

**Minimal degrees:** 2 polynomial(s) with degree 1.

**Polynomial with linear degree:** Removing variable $x_{32}$ from all other polynomials by reducing them with polynomial $p_{31}$ from previous step.

Finished a triangulation step, the current system is:

$$
\begin{aligned}
p_1 &= 2x_1 - \\
p_2 &= 2x_2 - \\
p_3 &= 2x_4 - \\
p_4 &= 2x_5 - x_1 - \\
p_5 &= 2x_6 - x_2 \\
p_6 &= 2x_7 - x_3 \\
p_7 &= x_{11}x_2 + x_9 - x_2 \\
p_8 &= x_{11}x_3 + x_{10} - x_3 \\
p_9 &= -x_{12}x_5 + x_8 \\
p_{10} &= -x_{12}x_6 + x_9 \\
p_{11} &= -x_{12}x_7 + x_{10} \\
p_{12} &= 2x_{13} - 2 \\
p_{13} &= 2x_{14} - \\
p_{14} &= -x_{18}x_{14} + x_{18}x_2 + x_{16} - x_2 \\
p_{15} &= x_{18}x_3 + x_{17} - x_3 \\
p_{16} &= -x_{19}x_5 + x_{19} + x_{15} - \\
p_{17} &= -x_{19}x_6 + x_{19} + x_{16} - \\
p_{18} &= -x_{19}x_7 + x_{17} \\
p_{19} &= 2x_{20} - \\
p_{20} &= 2x_{21} - 2 \\
p_{21} &= 2x_{22} - x_1 - \\
p_{22} &= 2x_{23} - x_2 - \\
p_{23} &= 2x_{24} - x_3 \\
p_{24} &= -x_{28}x_{23} + x_{28} + x_{26} - \\
p_{25} &= -x_{28}x_{24} + x_{27} \\
p_{26} &= -x_{29}x_{20} + x_{29}x_1 + x_{25} - x_1 \\
p_{27} &= -x_{29}x_{21} + x_{29}x_2 + x_{26} - x_2 \\
p_{28} &= x_{29}x_3 + x_{27} - x_3 \\
p_{29} &= x_{30} - \\
p_{30} &= x_{31} - x_{27}x_{16} + x_{27}x_9 + x_{26}x_{17} - x_{26}x_{10} - x_{17}x_9 + x_{16}x_{10} \\
p_{31} &= x_{42}x_{30}x_{26}x_{15} - x_{42}x_{30}x_{26}x_8 - x_{42}x_{30}x_{25}x_{16} + \\
&\quad x_{42}x_{30}x_{25}x_9 + x_{42}x_{30}x_{16}x_8 - x_{42}x_{30}x_{15}x_9 - x_{31}x_8 +
\end{aligned}
$$

$$
\begin{aligned}
& x_{31}x_1 + x_{27}x_{15}x_9 - x_{27}x_{15}x_2 - x_{27}x_9x_8 + x_{27}x_8x_2 \\
& -x_{26}x_{15}x_{10} + x_{26}x_{15}x_3 + x_{26}x_{10}x_8 - x_{26}x_8x_3 - x_{25}x_{17}x_9 + \\
& x_{25}x_{17}x_2 + x_{25}x_{16}x_{10} - x_{25}x_{16}x_3 - x_{25}x_{10}x_2 + x_{25}x_9x_3 + \\
& x_{17}x_9x_8 - x_{17}x_8x_2 - x_{16}x_{10}x_8 + x_{16}x_8x_3 + x_{15}x_{10}x_2 \\
& -x_{15}x_9x_3
\end{aligned}
$$

$$
\begin{aligned}
p_{32} &= x_{32} + x_{27}x_{15} - x_{27}x_8 - x_{25}x_{17} + x_{25}x_{10} + x_{17}x_8 - x_{15}x_{10} \\
p_{33} &= x_{33} - x_{26}x_{15} + x_{26}x_8 + x_{25}x_{16} - x_{25}x_9 - x_{16}x_8 + x_{15}x_9 \\
p_{34} &= x_{34} + x_{33}x_{10} + x_{32}x_9 + x_{31}x_8 \\
p_{35} &= x_{35} - x_1 \\
p_{36} &= x_{36} - x_2 \\
p_{37} &= x_{37}x_{30} \\
p_{38} &= -x_{38}x_{30} + x_{37} - x_3 \\
p_{39} &= x_{39} - x_1 \\
p_{40} &= x_{40} - x_2 \\
p_{41} &= -x_{42}x_{30} + x_{41} - x_3
\end{aligned}
$$

## 1.11 Triangulation, step 11

**Choosing variable:** Trying the variable with index 31.

**Variable $x_{31}$ selected:** The number of polynomials with this variable, with indexes from 1 to 31, is 2.

**Minimal degrees:** 2 polynomial(s) with degree 1.

**Polynomial with linear degree:** Removing variable $x_{31}$ from all other polynomials by reducing them with polynomial $p_{30}$ from previous step.

Finished a triangulation step, the current system is:

$$
\begin{aligned}
p_1 &= 2x_1 - \\
p_2 &= 2x_2 - \\
p_3 &= 2x_4 - \\
p_4 &= 2x_5 - x_1 - \\
p_5 &= 2x_6 - x_2 \\
p_6 &= 2x_7 - x_3 \\
p_7 &= x_{11}x_2 + x_9 - x_2 \\
p_8 &= x_{11}x_3 + x_{10} - x_3 \\
p_9 &= -x_{12}x_5 + x_8 \\
p_{10} &= -x_{12}x_6 + x_9 \\
p_{11} &= -x_{12}x_7 + x_{10} \\
p_{12} &= 2x_{13} - 2 \\
p_{13} &= 2x_{14} - \\
p_{14} &= -x_{18}x_{14} + x_{18}x_2 + x_{16} - x_2
\end{aligned}
$$

$$
\begin{aligned}
p_{15} &= x_{18}x_3 + x_{17} - x_3 \\
p_{16} &= -x_{19}x_5 + x_{19} + x_{15} - \\
p_{17} &= -x_{19}x_6 + x_{19} + x_{16} - \\
p_{18} &= -x_{19}x_7 + x_{17} \\
p_{19} &= 2x_{20} - \\
p_{20} &= 2x_{21} - 2 \\
p_{21} &= 2x_{22} - x_1 - \\
p_{22} &= 2x_{23} - x_2 - \\
p_{23} &= 2x_{24} - x_3 \\
p_{24} &= -x_{28}x_{23} + x_{28} + x_{26} - \\
p_{25} &= -x_{28}x_{24} + x_{27} \\
p_{26} &= -x_{29}x_{20} + x_{29}x_1 + x_{25} - x_1 \\
p_{27} &= -x_{29}x_{21} + x_{29}x_2 + x_{26} - x_2 \\
p_{28} &= x_{29}x_3 + x_{27} - x_3 \\
p_{29} &= x_{30} - \\
p_{30} &= x_{42}x_{30}x_{26}x_{15} - x_{42}x_{30}x_{26}x_8 - x_{42}x_{30}x_{25}x_{16} + \\
&\quad x_{42}x_{30}x_{25}x_9 + x_{42}x_{30}x_{16}x_8 - x_{42}x_{30}x_{15}x_9 - x_{27}x_{16}x_8 + \\
&\quad x_{27}x_{16}x_1 + x_{27}x_{15}x_9 - x_{27}x_{15}x_2 - x_{27}x_9x_1 + x_{27}x_8x_2 + \\
&\quad x_{26}x_{17}x_8 - x_{26}x_{17}x_1 - x_{26}x_{15}x_{10} + x_{26}x_{15}x_3 + x_{26}x_{10}x_1 \\
&\quad -x_{26}x_8x_3 - x_{25}x_{17}x_9 + x_{25}x_{17}x_2 + x_{25}x_{16}x_{10} - x_{25}x_{16}x_3 \\
&\quad -x_{25}x_{10}x_2 + x_{25}x_9x_3 + x_{17}x_9x_1 - x_{17}x_8x_2 - x_{16}x_{10}x_1 + \\
&\quad x_{16}x_8x_3 + x_{15}x_{10}x_2 - x_{15}x_9x_3 \\
p_{31} &= x_{31} - x_{27}x_{16} + x_{27}x_9 + x_{26}x_{17} - x_{26}x_{10} - x_{17}x_9 + x_{16}x_{10} \\
p_{32} &= x_{32} + x_{27}x_{15} - x_{27}x_8 - x_{25}x_{17} + x_{25}x_{10} + x_{17}x_8 - x_{15}x_{10} \\
p_{33} &= x_{33} - x_{26}x_{15} + x_{26}x_8 + x_{25}x_{16} - x_{25}x_9 - x_{16}x_8 + x_{15}x_9 \\
p_{34} &= x_{34} + x_{33}x_{10} + x_{32}x_9 + x_{31}x_8 \\
p_{35} &= x_{35} - x_1 \\
p_{36} &= x_{36} - x_2 \\
p_{37} &= x_{37}x_{30} \\
p_{38} &= -x_{38}x_{30} + x_{37} - x_3 \\
p_{39} &= x_{39} - x_1 \\
p_{40} &= x_{40} - x_2 \\
p_{41} &= -x_{42}x_{30} + x_{41} - x_3
\end{aligned}
$$

## 1.12 Triangulation, step 12

**Choosing variable:** Trying the variable with index 30.

**Variable $x_{30}$ selected:** The number of polynomials with this variable, with indexes from 1 to 30, is 2.

**Minimal degrees:** 2 polynomial(s) with degree 1.

**Polynomial with linear degree:** Removing variable $x_{30}$ from all other polynomials by reducing them with polynomial $p_{29}$ from previous step.

Finished a triangulation step, the current system is:

$$
\begin{aligned}
p_1 &= 2x_1 - \\
p_2 &= 2x_2 - \\
p_3 &= 2x_4 - \\
p_4 &= 2x_5 - x_1 - \\
p_5 &= 2x_6 - x_2 \\
p_6 &= 2x_7 - x_3 \\
p_7 &= x_{11}x_2 + x_9 - x_2 \\
p_8 &= x_{11}x_3 + x_{10} - x_3 \\
p_9 &= -x_{12}x_5 + x_8 \\
p_{10} &= -x_{12}x_6 + x_9 \\
p_{11} &= -x_{12}x_7 + x_{10} \\
p_{12} &= 2x_{13} - 2 \\
p_{13} &= 2x_{14} - \\
p_{14} &= -x_{18}x_{14} + x_{18}x_2 + x_{16} - x_2 \\
p_{15} &= x_{18}x_3 + x_{17} - x_3 \\
p_{16} &= -x_{19}x_5 + x_{19} + x_{15} - \\
p_{17} &= -x_{19}x_6 + x_{19} + x_{16} - \\
p_{18} &= -x_{19}x_7 + x_{17} \\
p_{19} &= 2x_{20} - \\
p_{20} &= 2x_{21} - 2 \\
p_{21} &= 2x_{22} - x_1 - \\
p_{22} &= 2x_{23} - x_2 - \\
p_{23} &= 2x_{24} - x_3 \\
p_{24} &= -x_{28}x_{23} + x_{28} + x_{26} - \\
p_{25} &= -x_{28}x_{24} + x_{27} \\
p_{26} &= -x_{29}x_{20} + x_{29}x_1 + x_{25} - x_1 \\
p_{27} &= -x_{29}x_{21} + x_{29}x_2 + x_{26} - x_2 \\
p_{28} &= x_{29}x_3 + x_{27} - x_3 \\
p_{29} &= x_{42}x_{26}x_{15} - x_{42}x_{26}x_8 - x_{42}x_{25}x_{16} + x_{42}x_{25}x_9 + x_{42}x_{16}x_8 \\
&\quad -x_{42}x_{15}x_9 - x_{27}x_{16}x_8 + x_{27}x_{16}x_1 + x_{27}x_{15}x_9 - x_{27}x_{15}x_2 \\
&\quad -x_{27}x_9x_1 + x_{27}x_8x_2 + x_{26}x_{17}x_8 - x_{26}x_{17}x_1 - x_{26}x_{15}x_{10} + \\
&\quad x_{26}x_{15}x_3 + x_{26}x_{10}x_1 - x_{26}x_8x_3 - x_{25}x_{17}x_9 + x_{25}x_{17}x_2 + \\
&\quad x_{25}x_{16}x_{10} - x_{25}x_{16}x_3 - x_{25}x_{10}x_2 + x_{25}x_9x_3 + x_{17}x_9x_1 \\
&\quad -x_{17}x_8x_2 - x_{16}x_{10}x_1 + x_{16}x_8x_3 + x_{15}x_{10}x_2 - x_{15}x_9x_3 \\
p_{30} &= x_{30} - \\
p_{31} &= x_{31} - x_{27}x_{16} + x_{27}x_9 + x_{26}x_{17} - x_{26}x_{10} - x_{17}x_9 + x_{16}x_{10}
\end{aligned}
$$

$$
\begin{aligned}
p_{32} &= x_{32} + x_{27}x_{15} - x_{27}x_8 - x_{25}x_{17} + x_{25}x_{10} + x_{17}x_8 - x_{15}x_{10} \\
p_{33} &= x_{33} - x_{26}x_{15} + x_{26}x_8 + x_{25}x_{16} - x_{25}x_9 - x_{16}x_8 + x_{15}x_9 \\
p_{34} &= x_{34} + x_{33}x_{10} + x_{32}x_9 + x_{31}x_8 \\
p_{35} &= x_{35} - x_1 \\
p_{36} &= x_{36} - x_2 \\
p_{37} &= x_{37}x_{30} \\
p_{38} &= -x_{38}x_{30} + x_{37} - x_3 \\
p_{39} &= x_{39} - x_1 \\
p_{40} &= x_{40} - x_2 \\
p_{41} &= -x_{42}x_{30} + x_{41} - x_3
\end{aligned}
$$

## 1.13 Triangulation, step 13

**Choosing variable:** Trying the variable with index 29.

**Variable $x_{29}$ selected:** The number of polynomials with this variable, with indexes from 1 to 29, is 3.

**Minimal degrees:** 3 polynomial(s) with degree 1.

**Polynomial with linear degree:** Removing variable $x_{29}$ from all other polynomials by reducing them with polynomial $p_{26}$ from previous step.

Finished a triangulation step, the current system is:

$$
\begin{aligned}
p_1 &= 2x_1 - \\
p_2 &= 2x_2 - \\
p_3 &= 2x_4 - \\
p_4 &= 2x_5 - x_1 - \\
p_5 &= 2x_6 - x_2 \\
p_6 &= 2x_7 - x_3 \\
p_7 &= x_{11}x_2 + x_9 - x_2 \\
p_8 &= x_{11}x_3 + x_{10} - x_3 \\
p_9 &= -x_{12}x_5 + x_8 \\
p_{10} &= -x_{12}x_6 + x_9 \\
p_{11} &= -x_{12}x_7 + x_{10} \\
p_{12} &= 2x_{13} - 2 \\
p_{13} &= 2x_{14} - \\
p_{14} &= -x_{18}x_{14} + x_{18}x_2 + x_{16} - x_2 \\
p_{15} &= x_{18}x_3 + x_{17} - x_3 \\
p_{16} &= -x_{19}x_5 + x_{19} + x_{15} - \\
p_{17} &= -x_{19}x_6 + x_{19} + x_{16} - \\
p_{18} &= -x_{19}x_7 + x_{17} \\
p_{19} &= 2x_{20} -
\end{aligned}
$$

$$
\begin{aligned}
p_{20} &= 2x_{21} - 2 \\
p_{21} &= 2x_{22} - x_1 - \\
p_{22} &= 2x_{23} - x_2 - \\
p_{23} &= 2x_{24} - x_3 \\
p_{24} &= -x_{28}x_{23} + x_{28} + x_{26} - \\
p_{25} &= -x_{28}x_{24} + x_{27} \\
p_{26} &= x_{42}x_{26}x_{15} - x_{42}x_{26}x_8 - x_{42}x_{25}x_{16} + x_{42}x_{25}x_9 + x_{42}x_{16}x_8 \\
&\quad -x_{42}x_{15}x_9 - x_{27}x_{16}x_8 + x_{27}x_{16}x_1 + x_{27}x_{15}x_9 - x_{27}x_{15}x_2 \\
&\quad -x_{27}x_9x_1 + x_{27}x_8x_2 + x_{26}x_{17}x_8 - x_{26}x_{17}x_1 - x_{26}x_{15}x_{10} + \\
&\quad x_{26}x_{15}x_3 + x_{26}x_{10}x_1 - x_{26}x_8x_3 - x_{25}x_{17}x_9 + x_{25}x_{17}x_2 + \\
&\quad x_{25}x_{16}x_{10} - x_{25}x_{16}x_3 - x_{25}x_{10}x_2 + x_{25}x_9x_3 + x_{17}x_9x_1 \\
&\quad -x_{17}x_8x_2 - x_{16}x_{10}x_1 + x_{16}x_8x_3 + x_{15}x_{10}x_2 - x_{15}x_9x_3 \\
p_{27} &= -x_{26}x_{20} + x_{26}x_1 + x_{25}x_{21} - x_{25}x_2 - x_{21}x_1 + x_{20}x_2 \\
p_{28} &= -x_{27}x_{20} + x_{27}x_1 - x_{25}x_3 + x_{20}x_3 \\
p_{29} &= -x_{29}x_{20} + x_{29}x_1 + x_{25} - x_1 \\
p_{30} &= x_{30} - \\
p_{31} &= x_{31} - x_{27}x_{16} + x_{27}x_9 + x_{26}x_{17} - x_{26}x_{10} - x_{17}x_9 + x_{16}x_{10} \\
p_{32} &= x_{32} + x_{27}x_{15} - x_{27}x_8 - x_{25}x_{17} + x_{25}x_{10} + x_{17}x_8 - x_{15}x_{10} \\
p_{33} &= x_{33} - x_{26}x_{15} + x_{26}x_8 + x_{25}x_{16} - x_{25}x_9 - x_{16}x_8 + x_{15}x_9 \\
p_{34} &= x_{34} + x_{33}x_{10} + x_{32}x_9 + x_{31}x_8 \\
p_{35} &= x_{35} - x_1 \\
p_{36} &= x_{36} - x_2 \\
p_{37} &= x_{37}x_{30} \\
p_{38} &= -x_{38}x_{30} + x_{37} - x_3 \\
p_{39} &= x_{39} - x_1 \\
p_{40} &= x_{40} - x_2 \\
p_{41} &= -x_{42}x_{30} + x_{41} - x_3
\end{aligned}
$$

## 1.14 Triangulation, step 14

**Choosing variable:** Trying the variable with index 28.

**Variable $x_{28}$ selected:** The number of polynomials with this variable, with indexes from 1 to 28, is 2.

**Minimal degrees:** 2 polynomial(s) with degree 1.

**Polynomial with linear degree:** Removing variable $x_{28}$ from all other polynomials by reducing them with polynomial $p_{24}$ from previous step.

Finished a triangulation step, the current system is:

$$
\begin{aligned}
p_1 &= 2x_1 - \\
p_2 &= 2x_2 -
\end{aligned}
$$

$$
\begin{aligned}
p_3 &= 2x_4 - \\
p_4 &= 2x_5 - x_1 - \\
p_5 &= 2x_6 - x_2 \\
p_6 &= 2x_7 - x_3 \\
p_7 &= x_{11}x_2 + x_9 - x_2 \\
p_8 &= x_{11}x_3 + x_{10} - x_3 \\
p_9 &= -x_{12}x_5 + x_8 \\
p_{10} &= -x_{12}x_6 + x_9 \\
p_{11} &= -x_{12}x_7 + x_{10} \\
p_{12} &= 2x_{13} - 2 \\
p_{13} &= 2x_{14} - \\
p_{14} &= -x_{18}x_{14} + x_{18}x_2 + x_{16} - x_2 \\
p_{15} &= x_{18}x_3 + x_{17} - x_3 \\
p_{16} &= -x_{19}x_5 + x_{19} + x_{15} - \\
p_{17} &= -x_{19}x_6 + x_{19} + x_{16} - \\
p_{18} &= -x_{19}x_7 + x_{17} \\
p_{19} &= 2x_{20} - \\
p_{20} &= 2x_{21} - 2 \\
p_{21} &= 2x_{22} - x_1 - \\
p_{22} &= 2x_{23} - x_2 - \\
p_{23} &= 2x_{24} - x_3 \\
p_{24} &= x_{42}x_{26}x_{15} - x_{42}x_{26}x_8 - x_{42}x_{25}x_{16} + x_{42}x_{25}x_9 + x_{42}x_{16}x_8 \\
&\quad -x_{42}x_{15}x_9 - x_{27}x_{16}x_8 + x_{27}x_{16}x_1 + x_{27}x_{15}x_9 - x_{27}x_{15}x_2 \\
&\quad -x_{27}x_9x_1 + x_{27}x_8x_2 + x_{26}x_{17}x_8 - x_{26}x_{17}x_1 - x_{26}x_{15}x_{10} + \\
&\quad x_{26}x_{15}x_3 + x_{26}x_{10}x_1 - x_{26}x_8x_3 - x_{25}x_{17}x_9 + x_{25}x_{17}x_2 + \\
&\quad x_{25}x_{16}x_{10} - x_{25}x_{16}x_3 - x_{25}x_{10}x_2 + x_{25}x_9x_3 + x_{17}x_9x_1 \\
&\quad -x_{17}x_8x_2 - x_{16}x_{10}x_1 + x_{16}x_8x_3 + x_{15}x_{10}x_2 - x_{15}x_9x_3 \\
p_{25} &= -x_{26}x_{20} + x_{26}x_1 + x_{25}x_{21} - x_{25}x_2 - x_{21}x_1 + x_{20}x_2 \\
p_{26} &= -x_{27}x_{20} + x_{27}x_1 - x_{25}x_3 + x_{20}x_3 \\
p_{27} &= -x_{27}x_{23} + x_{27} + x_{26}x_{24} - x_{24} \\
p_{28} &= -x_{28}x_{23} + x_{28} + x_{26} - \\
p_{29} &= -x_{29}x_{20} + x_{29}x_1 + x_{25} - x_1 \\
p_{30} &= x_{30} - \\
p_{31} &= x_{31} - x_{27}x_{16} + x_{27}x_9 + x_{26}x_{17} - x_{26}x_{10} - x_{17}x_9 + x_{16}x_{10} \\
p_{32} &= x_{32} + x_{27}x_{15} - x_{27}x_8 - x_{25}x_{17} + x_{25}x_{10} + x_{17}x_8 - x_{15}x_{10} \\
p_{33} &= x_{33} - x_{26}x_{15} + x_{26}x_8 + x_{25}x_{16} - x_{25}x_9 - x_{16}x_8 + x_{15}x_9 \\
p_{34} &= x_{34} + x_{33}x_{10} + x_{32}x_9 + x_{31}x_8 \\
p_{35} &= x_{35} - x_1 \\
p_{36} &= x_{36} - x_2 \\
p_{37} &= x_{37}x_{30}
\end{aligned}
$$

$$
\begin{aligned}
p_{38} &= -x_{38}x_{30} + x_{37} - x_3 \\
p_{39} &= x_{39} - x_1 \\
p_{40} &= x_{40} - x_2 \\
p_{41} &= -x_{42}x_{30} + x_{41} - x_3
\end{aligned}
$$

## 1.15 Triangulation, step 15

**Choosing variable:** Trying the variable with index 27.

**Variable $x_{27}$ selected:** The number of polynomials with this variable, with indexes from 1 to 27, is 3.

**Minimal degrees:** 3 polynomial(s) with degree 1.

**Polynomial with linear degree:** Removing variable $x_{27}$ from all other polynomials by reducing them with polynomial $p_{24}$ from previous step.

Finished a triangulation step, the current system is:

$$
\begin{aligned}
p_1 &= 2x_1 - \\
p_2 &= 2x_2 - \\
p_3 &= 2x_4 - \\
p_4 &= 2x_5 - x_1 - \\
p_5 &= 2x_6 - x_2 \\
p_6 &= 2x_7 - x_3 \\
p_7 &= x_{11}x_2 + x_9 - x_2 \\
p_8 &= x_{11}x_3 + x_{10} - x_3 \\
p_9 &= -x_{12}x_5 + x_8 \\
p_{10} &= -x_{12}x_6 + x_9 \\
p_{11} &= -x_{12}x_7 + x_{10} \\
p_{12} &= 2x_{13} - 2 \\
p_{13} &= 2x_{14} - \\
p_{14} &= -x_{18}x_{14} + x_{18}x_2 + x_{16} - x_2 \\
p_{15} &= x_{18}x_3 + x_{17} - x_3 \\
p_{16} &= -x_{19}x_5 + x_{19} + x_{15} - \\
p_{17} &= -x_{19}x_6 + x_{19} + x_{16} - \\
p_{18} &= -x_{19}x_7 + x_{17} \\
p_{19} &= 2x_{20} - \\
p_{20} &= 2x_{21} - 2 \\
p_{21} &= 2x_{22} - x_1 - \\
p_{22} &= 2x_{23} - x_2 - \\
p_{23} &= 2x_{24} - x_3 \\
p_{24} &= -x_{26}x_{20} + x_{26}x_1 + x_{25}x_{21} - x_{25}x_2 - x_{21}x_1 + x_{20}x_2 \\
p_{25} &= x_{42}x_{26}x_{20}x_{15} - x_{42}x_{26}x_{20}x_8 - x_{42}x_{26}x_{15}x_1 +
\end{aligned}
$$

$$
\begin{aligned}
& x_{42}x_{26}x_8x_1 - x_{42}x_{25}x_{20}x_{16} + x_{42}x_{25}x_{20}x_9 + \\
& x_{42}x_{25}x_{16}x_1 - x_{42}x_{25}x_9x_1 + x_{42}x_{20}x_{16}x_8 \\
& -x_{42}x_{20}x_{15}x_9 - x_{42}x_{16}x_8x_1 + x_{42}x_{15}x_9x_1 + \\
& x_{26}x_{20}x_{17}x_8 - x_{26}x_{20}x_{17}x_1 - x_{26}x_{20}x_{15}x_{10} + \\
& x_{26}x_{20}x_{15}x_3 + x_{26}x_{20}x_{10}x_1 - x_{26}x_{20}x_8x_3 \\
& -x_{26}x_{17}x_8x_1 + x_{26}x_{17}x_1^2 + x_{26}x_{15}x_{10}x_1 - x_{26}x_{15}x_3x_1 \\
& -x_{26}x_{10}x_1^2 + x_{26}x_8x_3x_1 - x_{25}x_{20}x_{17}x_9 + x_{25}x_{20}x_{17}x_2 + \\
& x_{25}x_{20}x_{16}x_{10} - x_{25}x_{20}x_{16}x_3 - x_{25}x_{20}x_{10}x_2 + \\
& x_{25}x_{20}x_9x_3 + x_{25}x_{17}x_9x_1 - x_{25}x_{17}x_2x_1 \\
& -x_{25}x_{16}x_{10}x_1 + x_{25}x_{16}x_8x_3 - x_{25}x_{15}x_9x_3 + \\
& x_{25}x_{15}x_3x_2 + x_{25}x_{10}x_2x_1 - x_{25}x_8x_3x_2 + x_{20}x_{17}x_9x_1 \\
& -x_{20}x_{17}x_8x_2 - x_{20}x_{16}x_{10}x_1 + x_{20}x_{16}x_3x_1 + \\
& x_{20}x_{15}x_{10}x_2 - x_{20}x_{15}x_3x_2 - x_{20}x_9x_3x_1 + x_{20}x_8x_3x_2 \\
& -x_{17}x_9x_1^2 + x_{17}x_8x_2x_1 + x_{16}x_{10}x_1^2 - x_{16}x_8x_3x_1 \\
& -x_{15}x_{10}x_2x_1 + x_{15}x_9x_3x_1
\end{aligned}
$$

$$
\begin{aligned}
p_{26} \;=\;& x_{42}x_{26}x_{23}x_{15} - x_{42}x_{26}x_{23}x_8 - x_{42}x_{26}x_{15} + x_{42}x_{26}x_8 \\
& -x_{42}x_{25}x_{23}x_{16} + x_{42}x_{25}x_{23}x_9 + x_{42}x_{25}x_{16} - x_{42}x_{25}x_9 + \\
& x_{42}x_{23}x_{16}x_8 - x_{42}x_{23}x_{15}x_9 - x_{42}x_{16}x_8 + x_{42}x_{15}x_9 \\
& -x_{26}x_{24}x_{16}x_8 + x_{26}x_{24}x_{16}x_1 + x_{26}x_{24}x_{15}x_9 \\
& -x_{26}x_{24}x_{15}x_2 - x_{26}x_{24}x_9x_1 + x_{26}x_{24}x_8x_2 + \\
& x_{26}x_{23}x_{17}x_8 - x_{26}x_{23}x_{17}x_1 - x_{26}x_{23}x_{15}x_{10} + \\
& x_{26}x_{23}x_{15}x_3 + x_{26}x_{23}x_{10}x_1 - x_{26}x_{23}x_8x_3 - x_{26}x_{17}x_8 + \\
& x_{26}x_{17}x_1 + x_{26}x_{15}x_{10} - x_{26}x_{15}x_3 - x_{26}x_{10}x_1 + x_{26}x_8x_3 \\
& -x_{25}x_{23}x_{17}x_9 + x_{25}x_{23}x_{17}x_2 + x_{25}x_{23}x_{16}x_{10} \\
& -x_{25}x_{23}x_{16}x_3 - x_{25}x_{23}x_{10}x_2 + x_{25}x_{23}x_9x_3 + x_{25}x_{17}x_9 \\
& -x_{25}x_{17}x_2 - x_{25}x_{16}x_{10} + x_{25}x_{16}x_3 + x_{25}x_{10}x_2 - x_{25}x_9x_3 + \\
& x_{24}x_{16}x_8 - x_{24}x_{16}x_1 - x_{24}x_{15}x_9 + x_{24}x_{15}x_2 + x_{24}x_9x_1 \\
& -x_{24}x_8x_2 + x_{23}x_{17}x_9x_1 - x_{23}x_{17}x_8x_2 - x_{23}x_{16}x_{10}x_1 + \\
& x_{23}x_{16}x_8x_3 + x_{23}x_{15}x_{10}x_2 - x_{23}x_{15}x_9x_3 - x_{17}x_9x_1 + \\
& x_{17}x_8x_2 + x_{16}x_{10}x_1 - x_{16}x_8x_3 - x_{15}x_{10}x_2 + x_{15}x_9x_3 \\
p_{27} \;=\;& x_{42}x_{26}x_{15} - x_{42}x_{26}x_8 - x_{42}x_{25}x_{16} + x_{42}x_{25}x_9 + x_{42}x_{16}x_8 \\
& -x_{42}x_{15}x_9 - x_{27}x_{16}x_8 + x_{27}x_{16}x_1 + x_{27}x_{15}x_9 - x_{27}x_{15}x_2 \\
& -x_{27}x_9x_1 + x_{27}x_8x_2 + x_{26}x_{17}x_8 - x_{26}x_{17}x_1 - x_{26}x_{15}x_{10} + \\
& x_{26}x_{15}x_3 + x_{26}x_{10}x_1 - x_{26}x_8x_3 - x_{25}x_{17}x_9 + x_{25}x_{17}x_2 + \\
& x_{25}x_{16}x_{10} - x_{25}x_{16}x_3 - x_{25}x_{10}x_2 + x_{25}x_9x_3 + x_{17}x_9x_1 \\
& -x_{17}x_8x_2 - x_{16}x_{10}x_1 + x_{16}x_8x_3 + x_{15}x_{10}x_2 - x_{15}x_9x_3 \\
p_{28} \;=\;& -x_{28}x_{23} + x_{28} + x_{26} - \\
p_{29} \;=\;& -x_{29}x_{20} + x_{29}x_1 + x_{25} - x_1 \\
p_{30} \;=\;& x_{30} - \\
p_{31} \;=\;& x_{31} - x_{27}x_{16} + x_{27}x_9 + x_{26}x_{17} - x_{26}x_{10} - x_{17}x_9 + x_{16}x_{10}
\end{aligned}
$$

$$
\begin{aligned}
p_{32} &= x_{32} + x_{27}x_{15} - x_{27}x_8 - x_{25}x_{17} + x_{25}x_{10} + x_{17}x_8 - x_{15}x_{10} \\
p_{33} &= x_{33} - x_{26}x_{15} + x_{26}x_8 + x_{25}x_{16} - x_{25}x_9 - x_{16}x_8 + x_{15}x_9 \\
p_{34} &= x_{34} + x_{33}x_{10} + x_{32}x_9 + x_{31}x_8 \\
p_{35} &= x_{35} - x_1 \\
p_{36} &= x_{36} - x_2 \\
p_{37} &= x_{37}x_{30} \\
p_{38} &= -x_{38}x_{30} + x_{37} - x_3 \\
p_{39} &= x_{39} - x_1 \\
p_{40} &= x_{40} - x_2 \\
p_{41} &= -x_{42}x_{30} + x_{41} - x_3
\end{aligned}
$$

## 1.16 Triangulation, step 16

**Choosing variable:** Trying the variable with index 26.

**Variable $x_{26}$ selected:** The number of polynomials with this variable, with indexes from 1 to 26, is 3.

**Minimal degrees:** 3 polynomial(s) with degree 1.

**Polynomial with linear degree:** Removing variable $x_{26}$ from all other polynomials by reducing them with polynomial $p_{24}$ from previous step.

Finished a triangulation step, the current system is:

$$
\begin{aligned}
p_1 &= 2x_1 - \\
p_2 &= 2x_2 - \\
p_3 &= 2x_4 - \\
p_4 &= 2x_5 - x_1 - \\
p_5 &= 2x_6 - x_2 \\
p_6 &= 2x_7 - x_3 \\
p_7 &= x_{11}x_2 + x_9 - x_2 \\
p_8 &= x_{11}x_3 + x_{10} - x_3 \\
p_9 &= -x_{12}x_5 + x_8 \\
p_{10} &= -x_{12}x_6 + x_9 \\
p_{11} &= -x_{12}x_7 + x_{10} \\
p_{12} &= 2x_{13} - 2 \\
p_{13} &= 2x_{14} - \\
p_{14} &= -x_{18}x_{14} + x_{18}x_2 + x_{16} - x_2 \\
p_{15} &= x_{18}x_3 + x_{17} - x_3 \\
p_{16} &= -x_{19}x_5 + x_{19} + x_{15} - \\
p_{17} &= -x_{19}x_6 + x_{19} + x_{16} - \\
p_{18} &= -x_{19}x_7 + x_{17} \\
p_{19} &= 2x_{20} -
\end{aligned}
$$

$$
\begin{aligned}
p_{20} &= 2x_{21} - 2 \\
p_{21} &= 2x_{22} - x_1 - \\
p_{22} &= 2x_{23} - x_2 - \\
p_{23} &= 2x_{24} - x_3 \\
p_{24} &= \ldots \\
p_{25} &= \ldots \\
p_{26} &= -x_{26}x_{20} + x_{26}x_1 + x_{25}x_{21} - x_{25}x_2 - x_{21}x_1 + x_{20}x_2 \\
p_{27} &= x_{42}x_{26}x_{15} - x_{42}x_{26}x_8 - x_{42}x_{25}x_{16} + x_{42}x_{25}x_9 + x_{42}x_{16}x_8 \\
&\quad -x_{42}x_{15}x_9 - x_{27}x_{16}x_8 + x_{27}x_{16}x_1 + x_{27}x_{15}x_9 - x_{27}x_{15}x_2 \\
&\quad -x_{27}x_9x_1 + x_{27}x_8x_2 + x_{26}x_{17}x_8 - x_{26}x_{17}x_1 - x_{26}x_{15}x_{10} + \\
&\quad x_{26}x_{15}x_3 + x_{26}x_{10}x_1 - x_{26}x_8x_3 - x_{25}x_{17}x_9 + x_{25}x_{17}x_2 + \\
&\quad x_{25}x_{16}x_{10} - x_{25}x_{16}x_3 - x_{25}x_{10}x_2 + x_{25}x_9x_3 + x_{17}x_9x_1 \\
&\quad -x_{17}x_8x_2 - x_{16}x_{10}x_1 + x_{16}x_8x_3 + x_{15}x_{10}x_2 - x_{15}x_9x_3 \\
p_{28} &= -x_{28}x_{23} + x_{28} + x_{26} - \\
p_{29} &= -x_{29}x_{20} + x_{29}x_1 + x_{25} - x_1 \\
p_{30} &= x_{30} - \\
p_{31} &= x_{31} - x_{27}x_{16} + x_{27}x_9 + x_{26}x_{17} - x_{26}x_{10} - x_{17}x_9 + x_{16}x_{10} \\
p_{32} &= x_{32} + x_{27}x_{15} - x_{27}x_8 - x_{25}x_{17} + x_{25}x_{10} + x_{17}x_8 - x_{15}x_{10} \\
p_{33} &= x_{33} - x_{26}x_{15} + x_{26}x_8 + x_{25}x_{16} - x_{25}x_9 - x_{16}x_8 + x_{15}x_9 \\
p_{34} &= x_{34} + x_{33}x_{10} + x_{32}x_9 + x_{31}x_8 \\
p_{35} &= x_{35} - x_1 \\
p_{36} &= x_{36} - x_2 \\
p_{37} &= x_{37}x_{30} \\
p_{38} &= -x_{38}x_{30} + x_{37} - x_3 \\
p_{39} &= x_{39} - x_1 \\
p_{40} &= x_{40} - x_2 \\
p_{41} &= -x_{42}x_{30} + x_{41} - x_3
\end{aligned}
$$

## 1.17 Triangulation, step 17

**Choosing variable:** Trying the variable with index 25.

**Variable $x_{25}$ selected:** The number of polynomials with this variable, with indexes from 1 to 25, is 2.

**Minimal degrees:** 2 polynomial(s) with degree 1.

**Polynomial with linear degree:** Removing variable $x_{25}$ from all other polynomials by reducing them with polynomial $p_{24}$ from previous step.

Finished a triangulation step, the current system is:

$$
\begin{aligned}
p_1 &= 2x_1 - \\
p_2 &= 2x_2 -
\end{aligned}
$$

$$
\begin{aligned}
p_3 &= 2x_4 - \\
p_4 &= 2x_5 - x_1 - \\
p_5 &= 2x_6 - x_2 \\
p_6 &= 2x_7 - x_3 \\
p_7 &= x_{11}x_2 + x_9 - x_2 \\
p_8 &= x_{11}x_3 + x_{10} - x_3 \\
p_9 &= -x_{12}x_5 + x_8 \\
p_{10} &= -x_{12}x_6 + x_9 \\
p_{11} &= -x_{12}x_7 + x_{10} \\
p_{12} &= 2x_{13} - 2 \\
p_{13} &= 2x_{14} - \\
p_{14} &= -x_{18}x_{14} + x_{18}x_2 + x_{16} - x_2 \\
p_{15} &= x_{18}x_3 + x_{17} - x_3 \\
p_{16} &= -x_{19}x_5 + x_{19} + x_{15} - \\
p_{17} &= -x_{19}x_6 + x_{19} + x_{16} - \\
p_{18} &= -x_{19}x_7 + x_{17} \\
p_{19} &= 2x_{20} - \\
p_{20} &= 2x_{21} - 2 \\
p_{21} &= 2x_{22} - x_1 - \\
p_{22} &= 2x_{23} - x_2 - \\
p_{23} &= 2x_{24} - x_3 \\
p_{24} &= \ldots \\
p_{25} &= \ldots \\
p_{26} &= -x_{26}x_{20} + x_{26}x_1 + x_{25}x_{21} - x_{25}x_2 - x_{21}x_1 + x_{20}x_2 \\
p_{27} &= x_{42}x_{26}x_{15} - x_{42}x_{26}x_8 - x_{42}x_{25}x_{16} + x_{42}x_{25}x_9 + x_{42}x_{16}x_8 \\
&\quad -x_{42}x_{15}x_9 - x_{27}x_{16}x_8 + x_{27}x_{16}x_1 + x_{27}x_{15}x_9 - x_{27}x_{15}x_2 \\
&\quad -x_{27}x_9x_1 + x_{27}x_8x_2 + x_{26}x_{17}x_8 - x_{26}x_{17}x_1 - x_{26}x_{15}x_{10} + \\
&\quad x_{26}x_{15}x_3 + x_{26}x_{10}x_1 - x_{26}x_8x_3 - x_{25}x_{17}x_9 + x_{25}x_{17}x_2 + \\
&\quad x_{25}x_{16}x_{10} - x_{25}x_{16}x_3 - x_{25}x_{10}x_2 + x_{25}x_9x_3 + x_{17}x_9x_1 \\
&\quad -x_{17}x_8x_2 - x_{16}x_{10}x_1 + x_{16}x_8x_3 + x_{15}x_{10}x_2 - x_{15}x_9x_3 \\
p_{28} &= -x_{28}x_{23} + x_{28} + x_{26} - \\
p_{29} &= -x_{29}x_{20} + x_{29}x_1 + x_{25} - x_1 \\
p_{30} &= x_{30} - \\
p_{31} &= x_{31} - x_{27}x_{16} + x_{27}x_9 + x_{26}x_{17} - x_{26}x_{10} - x_{17}x_9 + x_{16}x_{10} \\
p_{32} &= x_{32} + x_{27}x_{15} - x_{27}x_8 - x_{25}x_{17} + x_{25}x_{10} + x_{17}x_8 - x_{15}x_{10} \\
p_{33} &= x_{33} - x_{26}x_{15} + x_{26}x_8 + x_{25}x_{16} - x_{25}x_9 - x_{16}x_8 + x_{15}x_9 \\
p_{34} &= x_{34} + x_{33}x_{10} + x_{32}x_9 + x_{31}x_8 \\
p_{35} &= x_{35} - x_1 \\
p_{36} &= x_{36} - x_2 \\
p_{37} &= x_{37}x_{30}
\end{aligned}
$$

$$
\begin{aligned}
p_{38} &= -x_{38}x_{30} + x_{37} - x_3 \\
p_{39} &= x_{39} - x_1 \\
p_{40} &= x_{40} - x_2 \\
p_{41} &= -x_{42}x_{30} + x_{41} - x_3
\end{aligned}
$$

## 1.18 Triangulation, step 18

**Choosing variable:** Trying the variable with index 24.

**Variable $x_{24}$ selected:** The number of polynomials with this variable, with indexes from 1 to 24, is 2.

**Minimal degrees:** 2 polynomial(s) with degree 1.

**Polynomial with linear degree:** Removing variable $x_{24}$ from all other polynomials by reducing them with polynomial $p_{23}$ from previous step.

Finished a triangulation step, the current system is:

$$
\begin{aligned}
p_1 &= 2x_1 - \\
p_2 &= 2x_2 - \\
p_3 &= 2x_4 - \\
p_4 &= 2x_5 - x_1 - \\
p_5 &= 2x_6 - x_2 \\
p_6 &= 2x_7 - x_3 \\
p_7 &= x_{11}x_2 + x_9 - x_2 \\
p_8 &= x_{11}x_3 + x_{10} - x_3 \\
p_9 &= -x_{12}x_5 + x_8 \\
p_{10} &= -x_{12}x_6 + x_9 \\
p_{11} &= -x_{12}x_7 + x_{10} \\
p_{12} &= 2x_{13} - 2 \\
p_{13} &= 2x_{14} - \\
p_{14} &= -x_{18}x_{14} + x_{18}x_2 + x_{16} - x_2 \\
p_{15} &= x_{18}x_3 + x_{17} - x_3 \\
p_{16} &= -x_{19}x_5 + x_{19} + x_{15} - \\
p_{17} &= -x_{19}x_6 + x_{19} + x_{16} - \\
p_{18} &= -x_{19}x_7 + x_{17} \\
p_{19} &= 2x_{20} - \\
p_{20} &= 2x_{21} - 2 \\
p_{21} &= 2x_{22} - x_1 - \\
p_{22} &= 2x_{23} - x_2 - \\
p_{23} &= \dots \\
p_{24} &= 2x_{24} - x_3 \\
p_{25} &= \dots
\end{aligned}
$$

$$
\begin{aligned}
p_{26} &= -x_{26}x_{20} + x_{26}x_1 + x_{25}x_{21} - x_{25}x_2 - x_{21}x_1 + x_{20}x_2 \\
p_{27} &= x_{42}x_{26}x_{15} - x_{42}x_{26}x_8 - x_{42}x_{25}x_{16} + x_{42}x_{25}x_9 + x_{42}x_{16}x_8 \\
&\quad -x_{42}x_{15}x_9 - x_{27}x_{16}x_8 + x_{27}x_{16}x_1 + x_{27}x_{15}x_9 - x_{27}x_{15}x_2 \\
&\quad -x_{27}x_9x_1 + x_{27}x_8x_2 + x_{26}x_{17}x_8 - x_{26}x_{17}x_1 - x_{26}x_{15}x_{10} + \\
&\quad x_{26}x_{15}x_3 + x_{26}x_{10}x_1 - x_{26}x_8x_3 - x_{25}x_{17}x_9 + x_{25}x_{17}x_2 + \\
&\quad x_{25}x_{16}x_{10} - x_{25}x_{16}x_3 - x_{25}x_{10}x_2 + x_{25}x_9x_3 + x_{17}x_9x_1 \\
&\quad -x_{17}x_8x_2 - x_{16}x_{10}x_1 + x_{16}x_8x_3 + x_{15}x_{10}x_2 - x_{15}x_9x_3 \\
p_{28} &= -x_{28}x_{23} + x_{28} + x_{26} - \\
p_{29} &= -x_{29}x_{20} + x_{29}x_1 + x_{25} - x_1 \\
p_{30} &= x_{30} - \\
p_{31} &= x_{31} - x_{27}x_{16} + x_{27}x_9 + x_{26}x_{17} - x_{26}x_{10} - x_{17}x_9 + x_{16}x_{10} \\
p_{32} &= x_{32} + x_{27}x_{15} - x_{27}x_8 - x_{25}x_{17} + x_{25}x_{10} + x_{17}x_8 - x_{15}x_{10} \\
p_{33} &= x_{33} - x_{26}x_{15} + x_{26}x_8 + x_{25}x_{16} - x_{25}x_9 - x_{16}x_8 + x_{15}x_9 \\
p_{34} &= x_{34} + x_{33}x_{10} + x_{32}x_9 + x_{31}x_8 \\
p_{35} &= x_{35} - x_1 \\
p_{36} &= x_{36} - x_2 \\
p_{37} &= x_{37}x_{30} \\
p_{38} &= -x_{38}x_{30} + x_{37} - x_3 \\
p_{39} &= x_{39} - x_1 \\
p_{40} &= x_{40} - x_2 \\
p_{41} &= -x_{42}x_{30} + x_{41} - x_3
\end{aligned}
$$

## 1.19 Triangulation, step 19

**Choosing variable:** Trying the variable with index 23.

**Variable $x_{23}$ selected:** The number of polynomials with this variable, with indexes from 1 to 23, is 2.

**Minimal degrees:** 2 polynomial(s) with degree 1.

**Polynomial with linear degree:** Removing variable $x_{23}$ from all other polynomials by reducing them with polynomial $p_{22}$ from previous step.

Finished a triangulation step, the current system is:

$$
\begin{aligned}
p_1 &= 2x_1 - \\
p_2 &= 2x_2 - \\
p_3 &= 2x_4 - \\
p_4 &= 2x_5 - x_1 - \\
p_5 &= 2x_6 - x_2 \\
p_6 &= 2x_7 - x_3 \\
p_7 &= x_{11}x_2 + x_9 - x_2 \\
p_8 &= x_{11}x_3 + x_{10} - x_3
\end{aligned}
$$

$$
\begin{aligned}
p_9 &= -x_{12}x_5 + x_8 \\
p_{10} &= -x_{12}x_6 + x_9 \\
p_{11} &= -x_{12}x_7 + x_{10} \\
p_{12} &= 2x_{13} - 2 \\
p_{13} &= 2x_{14} - \\
p_{14} &= -x_{18}x_{14} + x_{18}x_2 + x_{16} - x_2 \\
p_{15} &= x_{18}x_3 + x_{17} - x_3 \\
p_{16} &= -x_{19}x_5 + x_{19} + x_{15} - \\
p_{17} &= -x_{19}x_6 + x_{19} + x_{16} - \\
p_{18} &= -x_{19}x_7 + x_{17} \\
p_{19} &= 2x_{20} - \\
p_{20} &= 2x_{21} - 2 \\
p_{21} &= 2x_{22} - x_1 - \\
p_{22} &= \ldots \\
p_{23} &= 2x_{23} - x_2 - \\
p_{24} &= 2x_{24} - x_3 \\
p_{25} &= \ldots \\
p_{26} &= -x_{26}x_{20} + x_{26}x_1 + x_{25}x_{21} - x_{25}x_2 - x_{21}x_1 + x_{20}x_2 \\
p_{27} &= x_{42}x_{26}x_{15} - x_{42}x_{26}x_8 - x_{42}x_{25}x_{16} + x_{42}x_{25}x_9 + x_{42}x_{16}x_8 \\
&\quad -x_{42}x_{15}x_9 - x_{27}x_{16}x_8 + x_{27}x_{16}x_1 + x_{27}x_{15}x_9 - x_{27}x_{15}x_2 \\
&\quad -x_{27}x_9x_1 + x_{27}x_8x_2 + x_{26}x_{17}x_8 - x_{26}x_{17}x_1 - x_{26}x_{15}x_{10} + \\
&\quad x_{26}x_{15}x_3 + x_{26}x_{10}x_1 - x_{26}x_8x_3 - x_{25}x_{17}x_9 + x_{25}x_{17}x_2 + \\
&\quad x_{25}x_{16}x_{10} - x_{25}x_{16}x_3 - x_{25}x_{10}x_2 + x_{25}x_9x_3 + x_{17}x_9x_1 \\
&\quad -x_{17}x_8x_2 - x_{16}x_{10}x_1 + x_{16}x_8x_3 + x_{15}x_{10}x_2 - x_{15}x_9x_3 \\
p_{28} &= -x_{28}x_{23} + x_{28} + x_{26} - \\
p_{29} &= -x_{29}x_{20} + x_{29}x_1 + x_{25} - x_1 \\
p_{30} &= x_{30} - \\
p_{31} &= x_{31} - x_{27}x_{16} + x_{27}x_9 + x_{26}x_{17} - x_{26}x_{10} - x_{17}x_9 + x_{16}x_{10} \\
p_{32} &= x_{32} + x_{27}x_{15} - x_{27}x_8 - x_{25}x_{17} + x_{25}x_{10} + x_{17}x_8 - x_{15}x_{10} \\
p_{33} &= x_{33} - x_{26}x_{15} + x_{26}x_8 + x_{25}x_{16} - x_{25}x_9 - x_{16}x_8 + x_{15}x_9 \\
p_{34} &= x_{34} + x_{33}x_{10} + x_{32}x_9 + x_{31}x_8 \\
p_{35} &= x_{35} - x_1 \\
p_{36} &= x_{36} - x_2 \\
p_{37} &= x_{37}x_{30} \\
p_{38} &= -x_{38}x_{30} + x_{37} - x_3 \\
p_{39} &= x_{39} - x_1 \\
p_{40} &= x_{40} - x_2 \\
p_{41} &= -x_{42}x_{30} + x_{41} - x_3
\end{aligned}
$$

## 1.20 Triangulation, step 20

**Choosing variable:** Trying the variable with index 22.

**Variable $x_{22}$ selected:** The number of polynomials with this variable, with indexes from 1 to 22, is 1.

**Single polynomial with chosen variable:** Chosen polynomial is $p_{21}$. No reduction needed.

The triangular system has not been changed.

## 1.21 Triangulation, step 21

**Choosing variable:** Trying the variable with index 21.

**Variable $x_{21}$ selected:** The number of polynomials with this variable, with indexes from 1 to 21, is 2.

**Minimal degrees:** 2 polynomial(s) with degree 1.

**Polynomial with linear degree:** Removing variable $x_{21}$ from all other polynomials by reducing them with polynomial $p_{20}$ from previous step.

Finished a triangulation step, the current system is:

$$
\begin{aligned}
p_1 &= 2x_1 - \\
p_2 &= 2x_2 - \\
p_3 &= 2x_4 - \\
p_4 &= 2x_5 - x_1 - \\
p_5 &= 2x_6 - x_2 \\
p_6 &= 2x_7 - x_3 \\
p_7 &= x_{11}x_2 + x_9 - x_2 \\
p_8 &= x_{11}x_3 + x_{10} - x_3 \\
p_9 &= -x_{12}x_5 + x_8 \\
p_{10} &= -x_{12}x_6 + x_9 \\
p_{11} &= -x_{12}x_7 + x_{10} \\
p_{12} &= 2x_{13} - 2 \\
p_{13} &= 2x_{14} - \\
p_{14} &= -x_{18}x_{14} + x_{18}x_2 + x_{16} - x_2 \\
p_{15} &= x_{18}x_3 + x_{17} - x_3 \\
p_{16} &= -x_{19}x_5 + x_{19} + x_{15} - \\
p_{17} &= -x_{19}x_6 + x_{19} + x_{16} - \\
p_{18} &= -x_{19}x_7 + x_{17} \\
p_{19} &= 2x_{20} - \\
p_{20} &= 0 \\
p_{21} &= 2x_{21} - 2
\end{aligned}
$$

$$
\begin{aligned}
p_{22} &= 2x_{22} - x_1 - \\
p_{23} &= 2x_{23} - x_2 - \\
p_{24} &= 2x_{24} - x_3 \\
p_{25} &= \ldots \\
p_{26} &= -x_{26}x_{20} + x_{26}x_1 + x_{25}x_{21} - x_{25}x_2 - x_{21}x_1 + x_{20}x_2 \\
p_{27} &= x_{42}x_{26}x_{15} - x_{42}x_{26}x_8 - x_{42}x_{25}x_{16} + x_{42}x_{25}x_9 + x_{42}x_{16}x_8 \\
&\quad -x_{42}x_{15}x_9 - x_{27}x_{16}x_8 + x_{27}x_{16}x_1 + x_{27}x_{15}x_9 - x_{27}x_{15}x_2 \\
&\quad -x_{27}x_9x_1 + x_{27}x_8x_2 + x_{26}x_{17}x_8 - x_{26}x_{17}x_1 - x_{26}x_{15}x_{10} + \\
&\quad x_{26}x_{15}x_3 + x_{26}x_{10}x_1 - x_{26}x_8x_3 - x_{25}x_{17}x_9 + x_{25}x_{17}x_2 + \\
&\quad x_{25}x_{16}x_{10} - x_{25}x_{16}x_3 - x_{25}x_{10}x_2 + x_{25}x_9x_3 + x_{17}x_9x_1 \\
&\quad -x_{17}x_8x_2 - x_{16}x_{10}x_1 + x_{16}x_8x_3 + x_{15}x_{10}x_2 - x_{15}x_9x_3 \\
p_{28} &= -x_{28}x_{23} + x_{28} + x_{26} - \\
p_{29} &= -x_{29}x_{20} + x_{29}x_1 + x_{25} - x_1 \\
p_{30} &= x_{30} - \\
p_{31} &= x_{31} - x_{27}x_{16} + x_{27}x_9 + x_{26}x_{17} - x_{26}x_{10} - x_{17}x_9 + x_{16}x_{10} \\
p_{32} &= x_{32} + x_{27}x_{15} - x_{27}x_8 - x_{25}x_{17} + x_{25}x_{10} + x_{17}x_8 - x_{15}x_{10} \\
p_{33} &= x_{33} - x_{26}x_{15} + x_{26}x_8 + x_{25}x_{16} - x_{25}x_9 - x_{16}x_8 + x_{15}x_9 \\
p_{34} &= x_{34} + x_{33}x_{10} + x_{32}x_9 + x_{31}x_8 \\
p_{35} &= x_{35} - x_1 \\
p_{36} &= x_{36} - x_2 \\
p_{37} &= x_{37}x_{30} \\
p_{38} &= -x_{38}x_{30} + x_{37} - x_3 \\
p_{39} &= x_{39} - x_1 \\
p_{40} &= x_{40} - x_2 \\
p_{41} &= -x_{42}x_{30} + x_{41} - x_3
\end{aligned}
$$

## 1.22 Triangulation, step 22

**Choosing variable:** Trying the variable with index 20.

**Variable $x_{20}$ selected:** The number of polynomials with this variable, with indexes from 1 to 20, is 1.

**Single polynomial with chosen variable:** Chosen polynomial is $p_{19}$. No reduction needed.

The triangular system has not been changed.

## 1.23 Triangulation, step 23

**Choosing variable:** Trying the variable with index 19.

**Variable $x_{19}$ selected:** The number of polynomials with this variable, with indexes from 1 to 19, is 3.

**Minimal degrees:** 3 polynomial(s) with degree 1.

**Polynomial with linear degree:** Removing variable $x_{19}$ from all other polynomials by reducing them with polynomial $p_{16}$ from previous step.

Finished a triangulation step, the current system is:

$$
\begin{aligned}
p_1 &= 2x_1 - \\
p_2 &= 2x_2 - \\
p_3 &= 2x_4 - \\
p_4 &= 2x_5 - x_1 - \\
p_5 &= 2x_6 - x_2 \\
p_6 &= 2x_7 - x_3 \\
p_7 &= x_{11}x_2 + x_9 - x_2 \\
p_8 &= x_{11}x_3 + x_{10} - x_3 \\
p_9 &= -x_{12}x_5 + x_8 \\
p_{10} &= -x_{12}x_6 + x_9 \\
p_{11} &= -x_{12}x_7 + x_{10} \\
p_{12} &= 2x_{13} - 2 \\
p_{13} &= 2x_{14} - \\
p_{14} &= -x_{18}x_{14} + x_{18}x_2 + x_{16} - x_2 \\
p_{15} &= x_{18}x_3 + x_{17} - x_3 \\
p_{16} &= 0 \\
p_{17} &= -x_{16}x_5 + x_{16} + x_{15}x_6 - x_{15} - x_6 + x_5 \\
p_{18} &= -x_{17}x_5 + x_{17} + x_{15}x_7 - x_7 \\
p_{19} &= -x_{19}x_5 + x_{19} + x_{15} - \\
p_{20} &= 2x_{20} - \\
p_{21} &= 2x_{21} - 2 \\
p_{22} &= 2x_{22} - x_1 - \\
p_{23} &= 2x_{23} - x_2 - \\
p_{24} &= 2x_{24} - x_3 \\
p_{25} &= \dots \\
p_{26} &= -x_{26}x_{20} + x_{26}x_1 + x_{25}x_{21} - x_{25}x_2 - x_{21}x_1 + x_{20}x_2 \\
p_{27} &= x_{42}x_{26}x_{15} - x_{42}x_{26}x_8 - x_{42}x_{25}x_{16} + x_{42}x_{25}x_9 + x_{42}x_{16}x_8 \\
&\quad -x_{42}x_{15}x_9 - x_{27}x_{16}x_8 + x_{27}x_{16}x_1 + x_{27}x_{15}x_9 - x_{27}x_{15}x_2 \\
&\quad -x_{27}x_9x_1 + x_{27}x_8x_2 + x_{26}x_{17}x_8 - x_{26}x_{17}x_1 - x_{26}x_{15}x_{10} + \\
&\quad x_{26}x_{15}x_3 + x_{26}x_{10}x_1 - x_{26}x_8x_3 - x_{25}x_{17}x_9 + x_{25}x_{17}x_2 + \\
&\quad x_{25}x_{16}x_{10} - x_{25}x_{16}x_3 - x_{25}x_{10}x_2 + x_{25}x_9x_3 + x_{17}x_9x_1 \\
&\quad -x_{17}x_8x_2 - x_{16}x_{10}x_1 + x_{16}x_8x_3 + x_{15}x_{10}x_2 - x_{15}x_9x_3 \\
p_{28} &= -x_{28}x_{23} + x_{28} + x_{26} - \\
p_{29} &= -x_{29}x_{20} + x_{29}x_1 + x_{25} - x_1 \\
p_{30} &= x_{30} - \\
p_{31} &= x_{31} - x_{27}x_{16} + x_{27}x_9 + x_{26}x_{17} - x_{26}x_{10} - x_{17}x_9 + x_{16}x_{10}
\end{aligned}
$$

$$
\begin{aligned}
p_{32} &= x_{32} + x_{27}x_{15} - x_{27}x_8 - x_{25}x_{17} + x_{25}x_{10} + x_{17}x_8 - x_{15}x_{10} \\
p_{33} &= x_{33} - x_{26}x_{15} + x_{26}x_8 + x_{25}x_{16} - x_{25}x_9 - x_{16}x_8 + x_{15}x_9 \\
p_{34} &= x_{34} + x_{33}x_{10} + x_{32}x_9 + x_{31}x_8 \\
p_{35} &= x_{35} - x_1 \\
p_{36} &= x_{36} - x_2 \\
p_{37} &= x_{37}x_{30} \\
p_{38} &= -x_{38}x_{30} + x_{37} - x_3 \\
p_{39} &= x_{39} - x_1 \\
p_{40} &= x_{40} - x_2 \\
p_{41} &= -x_{42}x_{30} + x_{41} - x_3
\end{aligned}
$$

## 1.24 Triangulation, step 24

**Choosing variable:** Trying the variable with index 18.

**Variable $x_{18}$ selected:** The number of polynomials with this variable, with indexes from 1 to 18, is 2.

**Minimal degrees:** 2 polynomial(s) with degree 1.

**Polynomial with linear degree:** Removing variable $x_{18}$ from all other polynomials by reducing them with polynomial $p_{14}$ from previous step.

Finished a triangulation step, the current system is:

$$
\begin{aligned}
p_1 &= 2x_1 - \\
p_2 &= 2x_2 - \\
p_3 &= 2x_4 - \\
p_4 &= 2x_5 - x_1 - \\
p_5 &= 2x_6 - x_2 \\
p_6 &= 2x_7 - x_3 \\
p_7 &= x_{11}x_2 + x_9 - x_2 \\
p_8 &= x_{11}x_3 + x_{10} - x_3 \\
p_9 &= -x_{12}x_5 + x_8 \\
p_{10} &= -x_{12}x_6 + x_9 \\
p_{11} &= -x_{12}x_7 + x_{10} \\
p_{12} &= 2x_{13} - 2 \\
p_{13} &= 2x_{14} - \\
p_{14} &= 0 \\
p_{15} &= -x_{16}x_5 + x_{16} + x_{15}x_6 - x_{15} - x_6 + x_5 \\
p_{16} &= -x_{17}x_5 + x_{17} + x_{15}x_7 - x_7 \\
p_{17} &= -x_{17}x_{14} + x_{17}x_2 - x_{16}x_3 + x_{14}x_3 \\
p_{18} &= -x_{18}x_{14} + x_{18}x_2 + x_{16} - x_2 \\
p_{19} &= -x_{19}x_5 + x_{19} + x_{15} -
\end{aligned}
$$

$$
\begin{aligned}
p_{20} &= 2x_{20} - \\
p_{21} &= 2x_{21} - 2 \\
p_{22} &= 2x_{22} - x_1 - \\
p_{23} &= 2x_{23} - x_2 - \\
p_{24} &= 2x_{24} - x_3 \\
p_{25} &= \ldots \\
p_{26} &= -x_{26}x_{20} + x_{26}x_1 + x_{25}x_{21} - x_{25}x_2 - x_{21}x_1 + x_{20}x_2 \\
p_{27} &= x_{42}x_{26}x_{15} - x_{42}x_{26}x_8 - x_{42}x_{25}x_{16} + x_{42}x_{25}x_9 + x_{42}x_{16}x_8 \\
&\quad -x_{42}x_{15}x_9 - x_{27}x_{16}x_8 + x_{27}x_{16}x_1 + x_{27}x_{15}x_9 - x_{27}x_{15}x_2 \\
&\quad -x_{27}x_9x_1 + x_{27}x_8x_2 + x_{26}x_{17}x_8 - x_{26}x_{17}x_1 - x_{26}x_{15}x_{10} + \\
&\quad x_{26}x_{15}x_3 + x_{26}x_{10}x_1 - x_{26}x_8x_3 - x_{25}x_{17}x_9 + x_{25}x_{17}x_2 + \\
&\quad x_{25}x_{16}x_{10} - x_{25}x_{16}x_3 - x_{25}x_{10}x_2 + x_{25}x_9x_3 + x_{17}x_9x_1 \\
&\quad -x_{17}x_8x_2 - x_{16}x_{10}x_1 + x_{16}x_8x_3 + x_{15}x_{10}x_2 - x_{15}x_9x_3 \\
p_{28} &= -x_{28}x_{23} + x_{28} + x_{26} - \\
p_{29} &= -x_{29}x_{20} + x_{29}x_1 + x_{25} - x_1 \\
p_{30} &= x_{30} - \\
p_{31} &= x_{31} - x_{27}x_{16} + x_{27}x_9 + x_{26}x_{17} - x_{26}x_{10} - x_{17}x_9 + x_{16}x_{10} \\
p_{32} &= x_{32} + x_{27}x_{15} - x_{27}x_8 - x_{25}x_{17} + x_{25}x_{10} + x_{17}x_8 - x_{15}x_{10} \\
p_{33} &= x_{33} - x_{26}x_{15} + x_{26}x_8 + x_{25}x_{16} - x_{25}x_9 - x_{16}x_8 + x_{15}x_9 \\
p_{34} &= x_{34} + x_{33}x_{10} + x_{32}x_9 + x_{31}x_8 \\
p_{35} &= x_{35} - x_1 \\
p_{36} &= x_{36} - x_2 \\
p_{37} &= x_{37}x_{30} \\
p_{38} &= -x_{38}x_{30} + x_{37} - x_3 \\
p_{39} &= x_{39} - x_1 \\
p_{40} &= x_{40} - x_2 \\
p_{41} &= -x_{42}x_{30} + x_{41} - x_3
\end{aligned}
$$

## 1.25 Triangulation, step 25

**Choosing variable:** Trying the variable with index 17.

**Variable $x_{17}$ selected:** The number of polynomials with this variable, with indexes from 1 to 17, is 2.

**Minimal degrees:** 2 polynomial(s) with degree 1.

**Polynomial with linear degree:** Removing variable $x_{17}$ from all other polynomials by reducing them with polynomial $p_{16}$ from previous step.

Finished a triangulation step, the current system is:

$$
\begin{aligned}
p_1 &= 2x_1 - \\
p_2 &= 2x_2 -
\end{aligned}
$$

$$
\begin{aligned}
p_3 &= 2x_4 - \\
p_4 &= 2x_5 - x_1 - \\
p_5 &= 2x_6 - x_2 \\
p_6 &= 2x_7 - x_3 \\
p_7 &= x_{11}x_2 + x_9 - x_2 \\
p_8 &= x_{11}x_3 + x_{10} - x_3 \\
p_9 &= -x_{12}x_5 + x_8 \\
p_{10} &= -x_{12}x_6 + x_9 \\
p_{11} &= -x_{12}x_7 + x_{10} \\
p_{12} &= 2x_{13} - 2 \\
p_{13} &= 2x_{14} - \\
p_{14} &= 0 \\
p_{15} &= -x_{16}x_5 + x_{16} + x_{15}x_6 - x_{15} - x_6 + x_5 \\
p_{16} &= x_{16}x_5x_3 - x_{16}x_3 + x_{15}x_{14}x_7 - x_{15}x_7x_2 - x_{14}x_7 \\
&\quad -x_{14}x_5x_3 + x_{14}x_3 + x_7x_2 \\
p_{17} &= -x_{17}x_5 + x_{17} + x_{15}x_7 - x_7 \\
p_{18} &= -x_{18}x_{14} + x_{18}x_2 + x_{16} - x_2 \\
p_{19} &= -x_{19}x_5 + x_{19} + x_{15} - \\
p_{20} &= 2x_{20} - \\
p_{21} &= 2x_{21} - 2 \\
p_{22} &= 2x_{22} - x_1 - \\
p_{23} &= 2x_{23} - x_2 - \\
p_{24} &= 2x_{24} - x_3 \\
p_{25} &= \dots \\
p_{26} &= -x_{26}x_{20} + x_{26}x_1 + x_{25}x_{21} - x_{25}x_2 - x_{21}x_1 + x_{20}x_2 \\
p_{27} &= x_{42}x_{26}x_{15} - x_{42}x_{26}x_8 - x_{42}x_{25}x_{16} + x_{42}x_{25}x_9 + x_{42}x_{16}x_8 \\
&\quad -x_{42}x_{15}x_9 - x_{27}x_{16}x_8 + x_{27}x_{16}x_1 + x_{27}x_{15}x_9 - x_{27}x_{15}x_2 \\
&\quad -x_{27}x_9x_1 + x_{27}x_8x_2 + x_{26}x_{17}x_8 - x_{26}x_{17}x_1 - x_{26}x_{15}x_{10} + \\
&\quad x_{26}x_{15}x_3 + x_{26}x_{10}x_1 - x_{26}x_8x_3 - x_{25}x_{17}x_9 + x_{25}x_{17}x_2 + \\
&\quad x_{25}x_{16}x_{10} - x_{25}x_{16}x_3 - x_{25}x_{10}x_2 + x_{25}x_9x_3 + x_{17}x_9x_1 \\
&\quad -x_{17}x_8x_2 - x_{16}x_{10}x_1 + x_{16}x_8x_3 + x_{15}x_{10}x_2 - x_{15}x_9x_3 \\
p_{28} &= -x_{28}x_{23} + x_{28} + x_{26} - \\
p_{29} &= -x_{29}x_{20} + x_{29}x_1 + x_{25} - x_1 \\
p_{30} &= x_{30} - \\
p_{31} &= x_{31} - x_{27}x_{16} + x_{27}x_9 + x_{26}x_{17} - x_{26}x_{10} - x_{17}x_9 + x_{16}x_{10} \\
p_{32} &= x_{32} + x_{27}x_{15} - x_{27}x_8 - x_{25}x_{17} + x_{25}x_{10} + x_{17}x_8 - x_{15}x_{10} \\
p_{33} &= x_{33} - x_{26}x_{15} + x_{26}x_8 + x_{25}x_{16} - x_{25}x_9 - x_{16}x_8 + x_{15}x_9 \\
p_{34} &= x_{34} + x_{33}x_{10} + x_{32}x_9 + x_{31}x_8 \\
p_{35} &= x_{35} - x_1 \\
p_{36} &= x_{36} - x_2
\end{aligned}
$$

$$
\begin{aligned}
p_{37} &= x_{37}x_{30} \\
p_{38} &= -x_{38}x_{30} + x_{37} - x_3 \\
p_{39} &= x_{39} - x_1 \\
p_{40} &= x_{40} - x_2 \\
p_{41} &= -x_{42}x_{30} + x_{41} - x_3
\end{aligned}
$$

## 1.26 Triangulation, step 26

**Choosing variable:** Trying the variable with index 16.

**Variable $x_{16}$ selected:** The number of polynomials with this variable, with indexes from 1 to 16, is 2.

**Minimal degrees:** 2 polynomial(s) with degree 1.

**Polynomial with linear degree:** Removing variable $x_{16}$ from all other polynomials by reducing them with polynomial $p_{15}$ from previous step.

Finished a triangulation step, the current system is:

$$
\begin{aligned}
p_1 &= 2x_1 - \\
p_2 &= 2x_2 - \\
p_3 &= 2x_4 - \\
p_4 &= 2x_5 - x_1 - \\
p_5 &= 2x_6 - x_2 \\
p_6 &= 2x_7 - x_3 \\
p_7 &= x_{11}x_2 + x_9 - x_2 \\
p_8 &= x_{11}x_3 + x_{10} - x_3 \\
p_9 &= -x_{12}x_5 + x_8 \\
p_{10} &= -x_{12}x_6 + x_9 \\
p_{11} &= -x_{12}x_7 + x_{10} \\
p_{12} &= 2x_{13} - 2 \\
p_{13} &= 2x_{14} - \\
p_{14} &= 0 \\
p_{15} &= -x_{15}x_{14}x_7x_5 + x_{15}x_{14}x_7 + x_{15}x_7x_5x_2 - x_{15}x_7x_2 \\
&\quad -x_{15}x_6x_5x_3 + x_{15}x_6x_3 + x_{15}x_5x_3 - x_{15}x_3 + x_{14}x_7x_5 \\
&\quad -x_{14}x_7 + x_{14}x_5^2x_3 - 2x_{14}x_5x_3 + x_{14}x_3 - x_7x_5x_2 + x_7x_2 + \\
&\quad x_6x_5x_3 - x_6x_3 - x_5^2x_3 + x_5x_3 \\
p_{16} &= -x_{16}x_5 + x_{16} + x_{15}x_6 - x_{15} - x_6 + x_5 \\
p_{17} &= -x_{17}x_5 + x_{17} + x_{15}x_7 - x_7 \\
p_{18} &= -x_{18}x_{14} + x_{18}x_2 + x_{16} - x_2 \\
p_{19} &= -x_{19}x_5 + x_{19} + x_{15} - \\
p_{20} &= 2x_{20} - \\
p_{21} &= 2x_{21} - 2
\end{aligned}
$$

$$
\begin{aligned}
p_{22} &= 2x_{22} - x_1 - \\
p_{23} &= 2x_{23} - x_2 - \\
p_{24} &= 2x_{24} - x_3 \\
p_{25} &= \ldots \\
p_{26} &= -x_{26}x_{20} + x_{26}x_1 + x_{25}x_{21} - x_{25}x_2 - x_{21}x_1 + x_{20}x_2 \\
p_{27} &= x_{42}x_{26}x_{15} - x_{42}x_{26}x_8 - x_{42}x_{25}x_{16} + x_{42}x_{25}x_9 + x_{42}x_{16}x_8 \\
&\quad -x_{42}x_{15}x_9 - x_{27}x_{16}x_8 + x_{27}x_{16}x_1 + x_{27}x_{15}x_9 - x_{27}x_{15}x_2 \\
&\quad -x_{27}x_9x_1 + x_{27}x_8x_2 + x_{26}x_{17}x_8 - x_{26}x_{17}x_1 - x_{26}x_{15}x_{10} + \\
&\quad x_{26}x_{15}x_3 + x_{26}x_{10}x_1 - x_{26}x_8x_3 - x_{25}x_{17}x_9 + x_{25}x_{17}x_2 + \\
&\quad x_{25}x_{16}x_{10} - x_{25}x_{16}x_3 - x_{25}x_{10}x_2 + x_{25}x_9x_3 + x_{17}x_9x_1 \\
&\quad -x_{17}x_8x_2 - x_{16}x_{10}x_1 + x_{16}x_8x_3 + x_{15}x_{10}x_2 - x_{15}x_9x_3 \\
p_{28} &= -x_{28}x_{23} + x_{28} + x_{26} - \\
p_{29} &= -x_{29}x_{20} + x_{29}x_1 + x_{25} - x_1 \\
p_{30} &= x_{30} - \\
p_{31} &= x_{31} - x_{27}x_{16} + x_{27}x_9 + x_{26}x_{17} - x_{26}x_{10} - x_{17}x_9 + x_{16}x_{10} \\
p_{32} &= x_{32} + x_{27}x_{15} - x_{27}x_8 - x_{25}x_{17} + x_{25}x_{10} + x_{17}x_8 - x_{15}x_{10} \\
p_{33} &= x_{33} - x_{26}x_{15} + x_{26}x_8 + x_{25}x_{16} - x_{25}x_9 - x_{16}x_8 + x_{15}x_9 \\
p_{34} &= x_{34} + x_{33}x_{10} + x_{32}x_9 + x_{31}x_8 \\
p_{35} &= x_{35} - x_1 \\
p_{36} &= x_{36} - x_2 \\
p_{37} &= x_{37}x_{30} \\
p_{38} &= -x_{38}x_{30} + x_{37} - x_3 \\
p_{39} &= x_{39} - x_1 \\
p_{40} &= x_{40} - x_2 \\
p_{41} &= -x_{42}x_{30} + x_{41} - x_3
\end{aligned}
$$

## 1.27 Triangulation, step 27

**Choosing variable:** Trying the variable with index 15.

**Variable $x_{15}$ selected:** The number of polynomials with this variable, with indexes from 1 to 15, is 1.

**Single polynomial with chosen variable:** Chosen polynomial is $p_{15}$. No reduction needed.

The triangular system has not been changed.

## 1.28 Triangulation, step 28

**Choosing variable:** Trying the variable with index 14.

**Variable $x_{14}$ selected:** The number of polynomials with this variable, with indexes from 1 to 14, is 1.

**Single polynomial with chosen variable:** Chosen polynomial is $p_{13}$. No reduction needed.

The triangular system has not been changed.

## 1.29 Triangulation, step 29

**Choosing variable:** Trying the variable with index 13.

**Variable $x_{13}$ selected:** The number of polynomials with this variable, with indexes from 1 to 13, is 1.

**Single polynomial with chosen variable:** Chosen polynomial is $p_{12}$. No reduction needed.

The triangular system has not been changed.

## 1.30 Triangulation, step 30

**Choosing variable:** Trying the variable with index 12.

**Variable $x_{12}$ selected:** The number of polynomials with this variable, with indexes from 1 to 12, is 3.

**Minimal degrees:** 3 polynomial(s) with degree 1.

**Polynomial with linear degree:** Removing variable $x_{12}$ from all other polynomials by reducing them with polynomial $p_9$ from previous step.

Finished a triangulation step, the current system is:

$$
\begin{aligned}
p_1 &= 2x_1 - \\
p_2 &= 2x_2 - \\
p_3 &= 2x_4 - \\
p_4 &= 2x_5 - x_1 - \\
p_5 &= 2x_6 - x_2 \\
p_6 &= 2x_7 - x_3 \\
p_7 &= x_{11}x_2 + x_9 - x_2 \\
p_8 &= x_{11}x_3 + x_{10} - x_3 \\
p_9 &= 0 \\
p_{10} &= -x_9x_5 + x_8x_6 \\
p_{11} &= -x_{10}x_5 + x_8x_7 \\
p_{12} &= -x_{12}x_5 + x_8 \\
p_{13} &= 2x_{13} - 2 \\
p_{14} &= 2x_{14} - \\
p_{15} &= -x_{15}x_{14}x_7x_5 + x_{15}x_{14}x_7 + x_{15}x_7x_5x_2 - x_{15}x_7x_2 \\
&\quad -x_{15}x_6x_5x_3 + x_{15}x_6x_3 + x_{15}x_5x_3 - x_{15}x_3 + x_{14}x_7x_5 \\
&\quad -x_{14}x_7 + x_{14}x_5^2x_3 - 2x_{14}x_5x_3 + x_{14}x_3 - x_7x_5x_2 + x_7x_2 +
\end{aligned}
$$

$$
\begin{aligned}
& x_6x_5x_3 - x_6x_3 - x_5^2x_3 + x_5x_3 \\
p_{16} &= -x_{16}x_5 + x_{16} + x_{15}x_6 - x_{15} - x_6 + x_5 \\
p_{17} &= -x_{17}x_5 + x_{17} + x_{15}x_7 - x_7 \\
p_{18} &= -x_{18}x_{14} + x_{18}x_2 + x_{16} - x_2 \\
p_{19} &= -x_{19}x_5 + x_{19} + x_{15} - \\
p_{20} &= 2x_{20} - \\
p_{21} &= 2x_{21} - 2 \\
p_{22} &= 2x_{22} - x_1 - \\
p_{23} &= 2x_{23} - x_2 - \\
p_{24} &= 2x_{24} - x_3 \\
p_{25} &= \ldots \\
p_{26} &= -x_{26}x_{20} + x_{26}x_1 + x_{25}x_{21} - x_{25}x_2 - x_{21}x_1 + x_{20}x_2 \\
p_{27} &= x_{42}x_{26}x_{15} - x_{42}x_{26}x_8 - x_{42}x_{25}x_{16} + x_{42}x_{25}x_9 + x_{42}x_{16}x_8 \\
& \quad -x_{42}x_{15}x_9 - x_{27}x_{16}x_8 + x_{27}x_{16}x_1 + x_{27}x_{15}x_9 - x_{27}x_{15}x_2 \\
& \quad -x_{27}x_9x_1 + x_{27}x_8x_2 + x_{26}x_{17}x_8 - x_{26}x_{17}x_1 - x_{26}x_{15}x_{10} + \\
& \quad x_{26}x_{15}x_3 + x_{26}x_{10}x_1 - x_{26}x_8x_3 - x_{25}x_{17}x_9 + x_{25}x_{17}x_2 + \\
& \quad x_{25}x_{16}x_{10} - x_{25}x_{16}x_3 - x_{25}x_{10}x_2 + x_{25}x_9x_3 + x_{17}x_9x_1 \\
& \quad -x_{17}x_8x_2 - x_{16}x_{10}x_1 + x_{16}x_8x_3 + x_{15}x_{10}x_2 - x_{15}x_9x_3 \\
p_{28} &= -x_{28}x_{23} + x_{28} + x_{26} - \\
p_{29} &= -x_{29}x_{20} + x_{29}x_1 + x_{25} - x_1 \\
p_{30} &= x_{30} - \\
p_{31} &= x_{31} - x_{27}x_{16} + x_{27}x_9 + x_{26}x_{17} - x_{26}x_{10} - x_{17}x_9 + x_{16}x_{10} \\
p_{32} &= x_{32} + x_{27}x_{15} - x_{27}x_8 - x_{25}x_{17} + x_{25}x_{10} + x_{17}x_8 - x_{15}x_{10} \\
p_{33} &= x_{33} - x_{26}x_{15} + x_{26}x_8 + x_{25}x_{16} - x_{25}x_9 - x_{16}x_8 + x_{15}x_9 \\
p_{34} &= x_{34} + x_{33}x_{10} + x_{32}x_9 + x_{31}x_8 \\
p_{35} &= x_{35} - x_1 \\
p_{36} &= x_{36} - x_2 \\
p_{37} &= x_{37}x_{30} \\
p_{38} &= -x_{38}x_{30} + x_{37} - x_3 \\
p_{39} &= x_{39} - x_1 \\
p_{40} &= x_{40} - x_2 \\
p_{41} &= -x_{42}x_{30} + x_{41} - x_3
\end{aligned}
$$

## 1.31 Triangulation, step 31

**Choosing variable:** Trying the variable with index 11.

**Variable $x_{11}$ selected:** The number of polynomials with this variable, with indexes from 1 to 11, is 2.

**Minimal degrees:** 2 polynomial(s) with degree 1.

**Polynomial with linear degree:** Removing variable $x_{11}$ from all other polynomials by reducing them with polynomial $p_7$ from previous step.

Finished a triangulation step, the current system is:

$$
\begin{aligned}
p_1 &= 2x_1 - \\
p_2 &= 2x_2 - \\
p_3 &= 2x_4 - \\
p_4 &= 2x_5 - x_1 - \\
p_5 &= 2x_6 - x_2 \\
p_6 &= 2x_7 - x_3 \\
p_7 &= 0 \\
p_8 &= -x_9x_5 + x_8x_6 \\
p_9 &= -x_{10}x_5 + x_8x_7 \\
p_{10} &= x_{10}x_2 - x_9x_3 \\
p_{11} &= x_{11}x_2 + x_9 - x_2 \\
p_{12} &= -x_{12}x_5 + x_8 \\
p_{13} &= 2x_{13} - 2 \\
p_{14} &= 2x_{14} - \\
p_{15} &= -x_{15}x_{14}x_7x_5 + x_{15}x_{14}x_7 + x_{15}x_7x_5x_2 - x_{15}x_7x_2 \\
&\quad -x_{15}x_6x_5x_3 + x_{15}x_6x_3 + x_{15}x_5x_3 - x_{15}x_3 + x_{14}x_7x_5 \\
&\quad -x_{14}x_7 + x_{14}x_5^2x_3 - 2x_{14}x_5x_3 + x_{14}x_3 - x_7x_5x_2 + x_7x_2 + \\
&\quad x_6x_5x_3 - x_6x_3 - x_5^2x_3 + x_5x_3 \\
p_{16} &= -x_{16}x_5 + x_{16} + x_{15}x_6 - x_{15} - x_6 + x_5 \\
p_{17} &= -x_{17}x_5 + x_{17} + x_{15}x_7 - x_7 \\
p_{18} &= -x_{18}x_{14} + x_{18}x_2 + x_{16} - x_2 \\
p_{19} &= -x_{19}x_5 + x_{19} + x_{15} - \\
p_{20} &= 2x_{20} - \\
p_{21} &= 2x_{21} - 2 \\
p_{22} &= 2x_{22} - x_1 - \\
p_{23} &= 2x_{23} - x_2 - \\
p_{24} &= 2x_{24} - x_3 \\
p_{25} &= \ldots \\
p_{26} &= -x_{26}x_{20} + x_{26}x_1 + x_{25}x_{21} - x_{25}x_2 - x_{21}x_1 + x_{20}x_2 \\
p_{27} &= x_{42}x_{26}x_{15} - x_{42}x_{26}x_8 - x_{42}x_{25}x_{16} + x_{42}x_{25}x_9 + x_{42}x_{16}x_8 \\
&\quad -x_{42}x_{15}x_9 - x_{27}x_{16}x_8 + x_{27}x_{16}x_1 + x_{27}x_{15}x_9 - x_{27}x_{15}x_2 \\
&\quad -x_{27}x_9x_1 + x_{27}x_8x_2 + x_{26}x_{17}x_8 - x_{26}x_{17}x_1 - x_{26}x_{15}x_{10} + \\
&\quad x_{26}x_{15}x_3 + x_{26}x_{10}x_1 - x_{26}x_8x_3 - x_{25}x_{17}x_9 + x_{25}x_{17}x_2 + \\
&\quad x_{25}x_{16}x_{10} - x_{25}x_{16}x_3 - x_{25}x_{10}x_2 + x_{25}x_9x_3 + x_{17}x_9x_1 \\
&\quad -x_{17}x_8x_2 - x_{16}x_{10}x_1 + x_{16}x_8x_3 + x_{15}x_{10}x_2 - x_{15}x_9x_3 \\
p_{28} &= -x_{28}x_{23} + x_{28} + x_{26} -
\end{aligned}
$$

$$
\begin{aligned}
p_{29} &= -x_{29}x_{20} + x_{29}x_1 + x_{25} - x_1 \\
p_{30} &= x_{30} - \\
p_{31} &= x_{31} - x_{27}x_{16} + x_{27}x_9 + x_{26}x_{17} - x_{26}x_{10} - x_{17}x_9 + x_{16}x_{10} \\
p_{32} &= x_{32} + x_{27}x_{15} - x_{27}x_8 - x_{25}x_{17} + x_{25}x_{10} + x_{17}x_8 - x_{15}x_{10} \\
p_{33} &= x_{33} - x_{26}x_{15} + x_{26}x_8 + x_{25}x_{16} - x_{25}x_9 - x_{16}x_8 + x_{15}x_9 \\
p_{34} &= x_{34} + x_{33}x_{10} + x_{32}x_9 + x_{31}x_8 \\
p_{35} &= x_{35} - x_1 \\
p_{36} &= x_{36} - x_2 \\
p_{37} &= x_{37}x_{30} \\
p_{38} &= -x_{38}x_{30} + x_{37} - x_3 \\
p_{39} &= x_{39} - x_1 \\
p_{40} &= x_{40} - x_2 \\
p_{41} &= -x_{42}x_{30} + x_{41} - x_3
\end{aligned}
$$

## 1.32 Triangulation, step 32

**Choosing variable:** Trying the variable with index 10.

**Variable $x_{10}$ selected:** The number of polynomials with this variable, with indexes from 1 to 10, is 2.

**Minimal degrees:** 2 polynomial(s) with degree 1.

**Polynomial with linear degree:** Removing variable $x_{10}$ from all other polynomials by reducing them with polynomial $p_9$ from previous step.

Finished a triangulation step, the current system is:

$$
\begin{aligned}
p_1 &= 2x_1 - \\
p_2 &= 2x_2 - \\
p_3 &= 2x_4 - \\
p_4 &= 2x_5 - x_1 - \\
p_5 &= 2x_6 - x_2 \\
p_6 &= 2x_7 - x_3 \\
p_7 &= 0 \\
p_8 &= -x_9x_5 + x_8x_6 \\
p_9 &= x_9x_5x_3 - x_8x_7x_2 \\
p_{10} &= -x_{10}x_5 + x_8x_7 \\
p_{11} &= x_{11}x_2 + x_9 - x_2 \\
p_{12} &= -x_{12}x_5 + x_8 \\
p_{13} &= 2x_{13} - 2 \\
p_{14} &= 2x_{14} - \\
p_{15} &= -x_{15}x_{14}x_7x_5 + x_{15}x_{14}x_7 + x_{15}x_7x_5x_2 - x_{15}x_7x_2 \\
&\quad -x_{15}x_6x_5x_3 + x_{15}x_6x_3 + x_{15}x_5x_3 - x_{15}x_3 + x_{14}x_7x_5
\end{aligned}
$$

$$
\begin{aligned}
& -x_{14}x_7 + x_{14}x_5^2x_3 - 2x_{14}x_5x_3 + x_{14}x_3 - x_7x_5x_2 + x_7x_2 + \\
& x_6x_5x_3 - x_6x_3 - x_5^2x_3 + x_5x_3 \\
p_{16} &= -x_{16}x_5 + x_{16} + x_{15}x_6 - x_{15} - x_6 + x_5 \\
p_{17} &= -x_{17}x_5 + x_{17} + x_{15}x_7 - x_7 \\
p_{18} &= -x_{18}x_{14} + x_{18}x_2 + x_{16} - x_2 \\
p_{19} &= -x_{19}x_5 + x_{19} + x_{15} - \\
p_{20} &= 2x_{20} - \\
p_{21} &= 2x_{21} - 2 \\
p_{22} &= 2x_{22} - x_1 - \\
p_{23} &= 2x_{23} - x_2 - \\
p_{24} &= 2x_{24} - x_3 \\
p_{25} &= \ldots \\
p_{26} &= -x_{26}x_{20} + x_{26}x_1 + x_{25}x_{21} - x_{25}x_2 - x_{21}x_1 + x_{20}x_2 \\
p_{27} &= x_{42}x_{26}x_{15} - x_{42}x_{26}x_8 - x_{42}x_{25}x_{16} + x_{42}x_{25}x_9 + x_{42}x_{16}x_8 \\
& -x_{42}x_{15}x_9 - x_{27}x_{16}x_8 + x_{27}x_{16}x_1 + x_{27}x_{15}x_9 - x_{27}x_{15}x_2 \\
& -x_{27}x_9x_1 + x_{27}x_8x_2 + x_{26}x_{17}x_8 - x_{26}x_{17}x_1 - x_{26}x_{15}x_{10} + \\
& x_{26}x_{15}x_3 + x_{26}x_{10}x_1 - x_{26}x_8x_3 - x_{25}x_{17}x_9 + x_{25}x_{17}x_2 + \\
& x_{25}x_{16}x_{10} - x_{25}x_{16}x_3 - x_{25}x_{10}x_2 + x_{25}x_9x_3 + x_{17}x_9x_1 \\
& -x_{17}x_8x_2 - x_{16}x_{10}x_1 + x_{16}x_8x_3 + x_{15}x_{10}x_2 - x_{15}x_9x_3 \\
p_{28} &= -x_{28}x_{23} + x_{28} + x_{26} - \\
p_{29} &= -x_{29}x_{20} + x_{29}x_1 + x_{25} - x_1 \\
p_{30} &= x_{30} - \\
p_{31} &= x_{31} - x_{27}x_{16} + x_{27}x_9 + x_{26}x_{17} - x_{26}x_{10} - x_{17}x_9 + x_{16}x_{10} \\
p_{32} &= x_{32} + x_{27}x_{15} - x_{27}x_8 - x_{25}x_{17} + x_{25}x_{10} + x_{17}x_8 - x_{15}x_{10} \\
p_{33} &= x_{33} - x_{26}x_{15} + x_{26}x_8 + x_{25}x_{16} - x_{25}x_9 - x_{16}x_8 + x_{15}x_9 \\
p_{34} &= x_{34} + x_{33}x_{10} + x_{32}x_9 + x_{31}x_8 \\
p_{35} &= x_{35} - x_1 \\
p_{36} &= x_{36} - x_2 \\
p_{37} &= x_{37}x_{30} \\
p_{38} &= -x_{38}x_{30} + x_{37} - x_3 \\
p_{39} &= x_{39} - x_1 \\
p_{40} &= x_{40} - x_2 \\
p_{41} &= -x_{42}x_{30} + x_{41} - x_3
\end{aligned}
$$

## 1.33 Triangulation, step 33

**Choosing variable:** Trying the variable with index 9.

**Variable $x_9$ selected:** The number of polynomials with this variable, with indexes from 1 to 9, is 2.

**Minimal degrees:** 2 polynomial(s) with degree 1.

**Polynomial with linear degree:** Removing variable $x_9$ from all other polynomials by reducing them with polynomial $p_8$ from previous step.

Finished a triangulation step, the current system is:

$$
\begin{aligned}
p_1 &= 2x_1 - \\
p_2 &= 2x_2 - \\
p_3 &= 2x_4 - \\
p_4 &= 2x_5 - x_1 - \\
p_5 &= 2x_6 - x_2 \\
p_6 &= 2x_7 - x_3 \\
p_7 &= 0 \\
p_8 &= x_8x_7x_5x_2 - x_8x_6x_5x_3 \\
p_9 &= -x_9x_5 + x_8x_6 \\
p_{10} &= -x_{10}x_5 + x_8x_7 \\
p_{11} &= x_{11}x_2 + x_9 - x_2 \\
p_{12} &= -x_{12}x_5 + x_8 \\
p_{13} &= 2x_{13} - 2 \\
p_{14} &= 2x_{14} - \\
p_{15} &= -x_{15}x_{14}x_7x_5 + x_{15}x_{14}x_7 + x_{15}x_7x_5x_2 - x_{15}x_7x_2 \\
&\quad -x_{15}x_6x_5x_3 + x_{15}x_6x_3 + x_{15}x_5x_3 - x_{15}x_3 + x_{14}x_7x_5 \\
&\quad -x_{14}x_7 + x_{14}x_5^2x_3 - 2x_{14}x_5x_3 + x_{14}x_3 - x_7x_5x_2 + x_7x_2 + \\
&\quad x_6x_5x_3 - x_6x_3 - x_5^2x_3 + x_5x_3 \\
p_{16} &= -x_{16}x_5 + x_{16} + x_{15}x_6 - x_{15} - x_6 + x_5 \\
p_{17} &= -x_{17}x_5 + x_{17} + x_{15}x_7 - x_7 \\
p_{18} &= -x_{18}x_{14} + x_{18}x_2 + x_{16} - x_2 \\
p_{19} &= -x_{19}x_5 + x_{19} + x_{15} - \\
p_{20} &= 2x_{20} - \\
p_{21} &= 2x_{21} - 2 \\
p_{22} &= 2x_{22} - x_1 - \\
p_{23} &= 2x_{23} - x_2 - \\
p_{24} &= 2x_{24} - x_3 \\
p_{25} &= \dots \\
p_{26} &= -x_{26}x_{20} + x_{26}x_1 + x_{25}x_{21} - x_{25}x_2 - x_{21}x_1 + x_{20}x_2 \\
p_{27} &= x_{42}x_{26}x_{15} - x_{42}x_{26}x_8 - x_{42}x_{25}x_{16} + x_{42}x_{25}x_9 + x_{42}x_{16}x_8 \\
&\quad -x_{42}x_{15}x_9 - x_{27}x_{16}x_8 + x_{27}x_{16}x_1 + x_{27}x_{15}x_9 - x_{27}x_{15}x_2 \\
&\quad -x_{27}x_9x_1 + x_{27}x_8x_2 + x_{26}x_{17}x_8 - x_{26}x_{17}x_1 - x_{26}x_{15}x_{10} + \\
&\quad x_{26}x_{15}x_3 + x_{26}x_{10}x_1 - x_{26}x_8x_3 - x_{25}x_{17}x_9 + x_{25}x_{17}x_2 + \\
&\quad x_{25}x_{16}x_{10} - x_{25}x_{16}x_3 - x_{25}x_{10}x_2 + x_{25}x_9x_3 + x_{17}x_9x_1 \\
&\quad -x_{17}x_8x_2 - x_{16}x_{10}x_1 + x_{16}x_8x_3 + x_{15}x_{10}x_2 - x_{15}x_9x_3 \\
p_{28} &= -x_{28}x_{23} + x_{28} + x_{26} -
\end{aligned}
$$

$$
\begin{aligned}
p_{29} &= -x_{29}x_{20} + x_{29}x_1 + x_{25} - x_1 \\
p_{30} &= x_{30} - \\
p_{31} &= x_{31} - x_{27}x_{16} + x_{27}x_9 + x_{26}x_{17} - x_{26}x_{10} - x_{17}x_9 + x_{16}x_{10} \\
p_{32} &= x_{32} + x_{27}x_{15} - x_{27}x_8 - x_{25}x_{17} + x_{25}x_{10} + x_{17}x_8 - x_{15}x_{10} \\
p_{33} &= x_{33} - x_{26}x_{15} + x_{26}x_8 + x_{25}x_{16} - x_{25}x_9 - x_{16}x_8 + x_{15}x_9 \\
p_{34} &= x_{34} + x_{33}x_{10} + x_{32}x_9 + x_{31}x_8 \\
p_{35} &= x_{35} - x_1 \\
p_{36} &= x_{36} - x_2 \\
p_{37} &= x_{37}x_{30} \\
p_{38} &= -x_{38}x_{30} + x_{37} - x_3 \\
p_{39} &= x_{39} - x_1 \\
p_{40} &= x_{40} - x_2 \\
p_{41} &= -x_{42}x_{30} + x_{41} - x_3
\end{aligned}
$$

## 1.34 Triangulation, step 34

**Choosing variable:** Trying the variable with index 8.

**Variable $x_8$ selected:** The number of polynomials with this variable, with indexes from 1 to 8, is 1.

**Single polynomial with chosen variable:** Chosen polynomial is $p_8$. No reduction needed.

The triangular system has not been changed.

## 1.35 Triangulation, step 35

**Choosing variable:** Trying the variable with index 7.

**Variable $x_7$ selected:** The number of polynomials with this variable, with indexes from 1 to 7, is 1.

**Single polynomial with chosen variable:** Chosen polynomial is $p_6$. No reduction needed.

The triangular system has not been changed.

## 1.36 Triangulation, step 36

**Choosing variable:** Trying the variable with index 6.

**Variable $x_6$ selected:** The number of polynomials with this variable, with indexes from 1 to 6, is 1.

**Single polynomial with chosen variable:** Chosen polynomial is $p_5$. No reduction needed.

The triangular system has not been changed.

### 1.37 Triangulation, step 37

**Choosing variable:** Trying the variable with index 5.

**Variable $x_5$ selected:** The number of polynomials with this variable, with indexes from 1 to 5, is 1.

**Single polynomial with chosen variable:** Chosen polynomial is $p_4$. No reduction needed.

The triangular system has not been changed.

### 1.38 Triangulation, step 38

**Choosing variable:** Trying the variable with index 4.

**Variable $x_4$ selected:** The number of polynomials with this variable, with indexes from 1 to 4, is 1.

**Single polynomial with chosen variable:** Chosen polynomial is $p_3$. No reduction needed.

The triangular system has not been changed.

### 1.39 Triangulation, step 39

**Choosing variable:** Trying the variable with index 3.

**Error:** Variable with index 3 not found in polynomial system.

## 2 Prover results

**Status:** Proving failed - general error occurred.