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:

$$\begin{aligned}
p_1 &= 2x_1 - \\
p_2 &= 4x_2^2 - 3 \\
p_3 &= 3x_3 - x_2 \\
p_4 &= 3x_4^2 - 2 \\
p_5 &= x_5 - x_2 \\
p_6 &= x_6 - x_1 \\
p_7 &= x_7 - x_3 \\
p_8 &= -x_9x_5 + x_8 - x_4 \\
p_9 &= x_8x_5 \\
p_{10} &= 2x_{10} - x_6 - x_1 \\
p_{11} &= 2x_{11} - x_7 - x_3 \\
p_{12} &= 2x_{12} - x_8 - x_4
\end{aligned}$$

1.1 Triangulation, step 1

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 1.

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

The triangular system has not been changed.

1.2 Triangulation, step 2

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 1.

Single polynomial with chosen variable: Chosen polynomial is p_{11}. No reduction needed.

The triangular system has not been changed.

1.3 Triangulation, step 3

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 1.

Single polynomial with chosen variable: Chosen polynomial is p_{10}. No reduction needed.

The triangular system has not been changed.

1.4 Triangulation, step 4

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 1.

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

The triangular system has not been changed.

1.5 Triangulation, step 5

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.

1.6 Triangulation, step 6

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_7. No reduction needed.

The triangular system has not been changed.

1.7 Triangulation, step 7

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_6. No reduction needed.

The triangular system has not been changed.

1.8 Triangulation, step 8

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_5. No reduction needed.

The triangular system has not been changed.

1.9 Triangulation, step 9

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_4. No reduction needed.

The triangular system has not been changed.

1.10 Triangulation, step 10

Choosing variable: Trying the variable with index 3.

Variable x_3 selected: The number of polynomials with this variable, with indexes from 1 to 3, is 1.

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

The triangular system has not been changed.

1.11 Triangulation, step 11

Choosing variable: Trying the variable with index 2.

Variable x_2 selected: The number of polynomials with this variable, with indexes from 1 to 2, is 1.

Single polynomial with chosen variable: Chosen polynomial is p_2. No reduction needed.

The triangular system has not been changed.

1.12 Triangulation, step 12

Choosing variable: Trying the variable with index 1.

Variable x_1 selected: The number of polynomials with this variable, with indexes from 1 to 1, is 1.

Single polynomial with chosen variable: Chosen polynomial is p_1. No reduction needed.

The triangular system has not been changed.

The triangular system is:

$$\begin{aligned}
p_1 &= 2x_1 - \\
p_2 &= 4x_2^2 - 3 \\
p_3 &= 3x_3 - x_2 \\
p_4 &= 3x_4^2 - 2 \\
p_5 &= x_5 - x_2 \\
p_6 &= x_6 - x_1 \\
p_7 &= x_7 - x_3 \\
p_8 &= x_8 x_5 \\
p_9 &= -x_9 x_5 + x_8 - x_4 \\
p_{10} &= 2x_{10} - x_6 - x_1 \\
p_{11} &= 2x_{11} - x_7 - x_3 \\
p_{12} &= 2x_{12} - x_8 - x_4
\end{aligned}$$

2 Final Remainder

2.1 Final remainder for conjecture geothm_zadatak

Calculating final remainder of the conclusion:

$$g = -x_{12}^2 - x_{11}^2 + x_{11}x_2 - x_{10}^2 + x_{10}x_1$$

with respect to the triangular system.

1. Pseudo remainder with p_{12} over variable x_{12}:

$$g = -4x_{11}^2 + 4x_{11}x_2 - 4x_{10}^2 + 4x_{10}x_1 - x_8^2 - 2x_8x_4 - x_4^2$$

2. Pseudo remainder with p_{11} over variable x_{11}:

$$\begin{aligned} g = & -16x_{10}^2 + 16x_{10}x_1 - 4x_8^2 - 8x_8x_4 - 4x_7^2 - 8x_7x_3 + 8x_7x_2 \\ & -4x_4^2 - 4x_3^2 + 8x_3x_2 \end{aligned}$$

3. Pseudo remainder with p_{10} over variable x_{10}:

$$\begin{aligned} g = & -16x_8^2 - 32x_8x_4 - 16x_7^2 - 32x_7x_3 + 32x_7x_2 - 16x_6^2 - 16x_4^2 \\ & -16x_3^2 + 32x_3x_2 + 16x_1^2 \end{aligned}$$

4. Pseudo remainder with p_9 over variable x_9:

$$\begin{aligned} g = & -16x_8^2 - 32x_8x_4 - 16x_7^2 - 32x_7x_3 + 32x_7x_2 - 16x_6^2 - 16x_4^2 \\ & -16x_3^2 + 32x_3x_2 + 16x_1^2 \end{aligned}$$

5. Pseudo remainder with p_8 over variable x_8:

$$\begin{aligned} g = & -16x_7^2x_5^2 - 32x_7x_5^2x_3 + 32x_7x_5^2x_2 - 16x_6^2x_5^2 \\ & -16x_5^2x_4^2 - 16x_5^2x_3^2 + 32x_5^2x_3x_2 + 16x_5^2x_1^2 \end{aligned}$$

6. Pseudo remainder with p_7 over variable x_7:

$$\begin{aligned} g = & -16x_6^2x_5^2 - 16x_5^2x_4^2 - 64x_5^2x_3^2 + 64x_5^2x_3x_2 + \\ & 16x_5^2x_1^2 \end{aligned}$$

7. Pseudo remainder with p_6 over variable x_6:

$$g = -16x_5^2x_4^2 - 64x_5^2x_3^2 + 64x_5^2x_3x_2$$

8. Pseudo remainder with p_5 over variable x_5:

$$g = -16x_4^2x_2^2 - 64x_3^2x_2^2 + 64x_3x_2^3$$

9. Pseudo remainder with p_4 over variable x_4:

$$g = -192x_3^2x_2^2 + 192x_3x_2^3 - 32x_2^2$$

10. Pseudo remainder with p_3 over variable x_3:

$$g = 384x_2^4 - 288x_2^2$$

11. Pseudo remainder with p_2 over variable x_2:

$$g = 0$$

12. Pseudo remainder with p_1 over variable x_1:

$$g = 0$$

3 Prover results

Status: Theorem has been proved.

Space Complexity: The biggest polynomial obtained during prover execution contains 10 terms.

Time Complexity: Time spent by the prover is 0.05 seconds.

4 NDG Conditions

NDG Conditions in readable form

- Failed to translate NDG Conditions to readable form