

Welcome to Canopy's interactive data-analysis environment!  
 with pylab-backend set to: qt  
 Type '?' for more information.

In [1]: %run "D:\KANSAS\PhD Program\RESEARCH\Pompei\conjecture.py"  
 IPython console for SymPy 0.7.6.1 (Python 2.7.9-32-bit) (ground types: python)

Enter an integer for M: 3

Enter an integer for n: 2  
 M = 3, n = 2:

Original equation:  
 <IPython.core.display.Math at 0xba55d68>  
 ('Time elapsed:', 0.5780000686645508, 'seconds')

Simplified left-hand-side, where  $f_{-j} = \text{conj}(f_j)$ :

$$4f_0^3\overline{f_2} + 12f_0^2f_1\overline{f_3} + 6f_0^2\overline{f_1}^2 + 24f_0f_1\overline{f_1f_2} + 24f_0f_2\overline{f_1f_3} + 12f_0f_2\overline{f_2}^2 + 24f_0f_3\overline{f_2f_3} + 12f_1^2\overline{f_1f_3} + 6f_1^2\overline{f_2}^2 + 24f_1f_2\overline{f_1f_3} + 12f_1f_2\overline{f_2}^2 + 24f_1f_3\overline{f_2f_3} + 12f_2^2\overline{f_1f_3} + 12f_2^2\overline{f_2}^2 + 24f_2f_3\overline{f_2f_3} + 12f_3^2\overline{f_2f_3}$$
  
 ('Time elapsed:', 1.937000036239624, 'seconds')

All possible solutions:

$\{f_1 : 0, f_2 : 0\}$   
 $\{f_1 : 0, f_2 : 0, f_3 : 0\}$

Generating report.  
 ('Time elapsed:', 4.430999994277954, 'seconds')

In [2]: %run "D:\KANSAS\PhD Program\RESEARCH\Pompei\conjecture.py"  
 IPython console for SymPy 0.7.6.1 (Python 2.7.9-32-bit) (ground types: python)

Enter an integer for M: 4

Enter an integer for n: 2  
 M = 4, n = 2:

Original equation:  
 <IPython.core.display.Math at 0xa0e2518>  
 ('Time elapsed:', 17.369999885559082, 'seconds')

Simplified left-hand-side, where  $f_{-j} = \text{conj}(f_j)$ :

$$4f_0^3\overline{f_2} + 12f_0^2f_1\overline{f_3} + 12f_0^2f_2\overline{f_4} + 6f_0^2\overline{f_1}^2 + 12f_0f_1^2\overline{f_4} + 24f_0f_1\overline{f_1f_2} + 24f_0f_2\overline{f_1f_3} + 12f_0f_2\overline{f_2}^2 + 24f_0f_3\overline{f_2f_3} + 12f_0f_3\overline{f_2f_4} + 12f_0f_4\overline{f_2f_3} + 12f_0f_4\overline{f_2f_4} + 12f_1^2\overline{f_1f_3} + 12f_1^2\overline{f_1f_4} + 12f_1^2\overline{f_2}^2 + 12f_1^2\overline{f_2f_4} + 24f_1f_2\overline{f_1f_3} + 24f_1f_2\overline{f_1f_4} + 24f_1f_2\overline{f_2}^2 + 24f_1f_2\overline{f_2f_4} + 24f_1f_3\overline{f_2f_3} + 24f_1f_3\overline{f_2f_4} + 24f_1f_4\overline{f_2f_3} + 24f_1f_4\overline{f_2f_4} + 12f_2^2\overline{f_1f_3} + 12f_2^2\overline{f_1f_4} + 12f_2^2\overline{f_2}^2 + 12f_2^2\overline{f_2f_4} + 24f_2f_3\overline{f_2f_3} + 24f_2f_3\overline{f_2f_4} + 24f_2f_4\overline{f_2f_3} + 24f_2f_4\overline{f_2f_4} + 12f_3^2\overline{f_2f_3} + 12f_3^2\overline{f_2f_4} + 12f_3^2\overline{f_3}^2 + 12f_3^2\overline{f_3f_4} + 24f_3f_4\overline{f_3}^2 + 24f_3f_4\overline{f_3f_4}$$
  
 ('Time elapsed:', 18.122999906539917, 'seconds')

All possible solutions:

$\{f_1 : 0, f_2 : 0, f_3 : 0\}$   
 $\{f_1 : 0, f_2 : 0, f_3 : 0\}$   
 $\{f_1 : 0, f_2 : 0, f_4 : 0\}$   
 $\{f_1 : 0, f_2 : 0, f_3 : 0, f_4 : 0\}$

Generating report.

('Time elapsed:', 21.842000007629395, 'seconds')

In [2]:

In [3]: %run "D:\KANSAS\PhD Program\RESEARCH\Pompei\conjecture.py"

IPython console for SymPy 0.7.6.1 (Python 2.7.9-32-bit) (ground types: python)

Enter an integer for M: 1

Enter an integer for n: 2

M = 1, n = 2:

Original equation:

<IPython.core.display.Math at 0xbe2b278>

('Time elapsed:', 0.0009999275207519531, 'seconds')

Simplified left-hand-side, where  $f_{-j} = \text{conj}(f_j)$ :

$$6f_0^2\overline{f_1}^2 + 4f_1\overline{f_1}^3$$

('Time elapsed:', 0.4179999828338623, 'seconds')

All possible solutions:

0

$$-\frac{\sqrt{6}}{2}\sqrt{-f_0^2}$$

$$\frac{\sqrt{6}}{2}\sqrt{-f_0^2}$$

Generating report.

('Time elapsed:', 2.8559999465942383, 'seconds')

In [3]:

In [4]: %run "D:\KANSAS\PhD Program\RESEARCH\Pompei\conjecture.py"

IPython console for SymPy 0.7.6.1 (Python 2.7.9-32-bit) (ground types: python)

Enter an integer for M: 5

Enter an integer for n: 2

M = 5, n = 2:

Original equation:

<IPython.core.display.Math at 0xbe29b00>

('Time elapsed:', 425.7779998779297, 'seconds')

Simplified left-hand-side, where  $f_{-j} = \text{conj}(f_j)$ :

$$4f_0^3\overline{f_2} + 12f_0^2\overline{f_1}f_3 + 12f_0^2\overline{f_2}f_4 + 12f_0^2\overline{f_3}f_5 + 6f_0^2\overline{f_1}^2 + 12f_0f_1^2\overline{f_4} + 24f_0f_1f_2\overline{f_5} + 24f_0f_1\overline{f_1}f_2 + 24f_1^3\overline{f_2} + 12f_1^2\overline{f_1}f_3 + 12f_1^2\overline{f_2}f_4 + 12f_1^2\overline{f_3}f_5 + 6f_1^2\overline{f_1}^2 + 12f_1f_2^2\overline{f_4} + 24f_1f_2f_3\overline{f_5} + 24f_1f_2\overline{f_1}f_3 + 24f_1f_2\overline{f_2}f_4 + 24f_1f_2\overline{f_3}f_5 + 6f_1f_2\overline{f_1}^2 + 12f_1f_3^2\overline{f_4} + 24f_1f_3f_4\overline{f_5} + 24f_1f_3\overline{f_1}f_4 + 24f_1f_3\overline{f_2}f_5 + 24f_1f_3\overline{f_3}f_1 + 6f_1f_3\overline{f_1}^2 + 12f_1f_4^2\overline{f_5} + 24f_1f_4f_5\overline{f_1} + 24f_1f_4\overline{f_1}f_5 + 6f_1f_4\overline{f_1}^2 + 12f_1f_5^2\overline{f_2} + 24f_1f_5f_2\overline{f_1} + 24f_1f_5\overline{f_1}f_2 + 6f_1f_5\overline{f_1}^2 + 12f_2^3\overline{f_3} + 12f_2^2\overline{f_1}f_4 + 12f_2^2\overline{f_2}f_5 + 6f_2^2\overline{f_1}^2 + 12f_2f_3^2\overline{f_4} + 24f_2f_3f_4\overline{f_5} + 24f_2f_3\overline{f_1}f_4 + 24f_2f_3\overline{f_2}f_5 + 6f_2f_3\overline{f_1}^2 + 12f_2f_4^2\overline{f_5} + 24f_2f_4f_5\overline{f_1} + 24f_2f_4\overline{f_1}f_5 + 6f_2f_4\overline{f_1}^2 + 12f_2f_5^2\overline{f_3} + 24f_2f_5f_3\overline{f_1} + 24f_2f_5\overline{f_1}f_3 + 6f_2f_5\overline{f_1}^2 + 12f_3^3\overline{f_4} + 24f_3^2\overline{f_1}f_5 + 24f_3^2\overline{f_2}f_1 + 6f_3^2\overline{f_1}^2 + 12f_3f_4^2\overline{f_5} + 24f_3f_4f_5\overline{f_1} + 24f_3f_4\overline{f_1}f_5 + 6f_3f_4\overline{f_1}^2 + 12f_3f_5^2\overline{f_3} + 24f_3f_5f_3\overline{f_1} + 24f_3f_5\overline{f_1}f_3 + 6f_3f_5\overline{f_1}^2 + 12f_4^3\overline{f_5} + 24f_4^2\overline{f_1}f_2 + 24f_4^2\overline{f_2}f_3 + 6f_4^2\overline{f_1}^2 + 12f_4f_5^2\overline{f_3} + 24f_4f_5f_3\overline{f_1} + 24f_4f_5\overline{f_1}f_3 + 6f_4f_5\overline{f_1}^2 + 12f_5^3\overline{f_3} + 12f_5^2\overline{f_1}f_4 + 12f_5^2\overline{f_2}f_1 + 6f_5^2\overline{f_1}^2 + 12f_5f_4^2\overline{f_5} + 24f_5f_4f_5\overline{f_1} + 24f_5f_4\overline{f_1}f_5 + 6f_5f_4\overline{f_1}^2 + 12f_5f_5^2\overline{f_3} + 24f_5f_5f_3\overline{f_1} + 24f_5f_5\overline{f_1}f_3 + 6f_5f_5\overline{f_1}^2$$

('Time elapsed:', 426.9489998817444, 'seconds')

All possible solutions:

$$\{f_1 : 0, f_2 : 0, f_3 : 0, f_4 : 0\}$$

Generating report.

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('Time elapsed:', 486.13699984550476, 'seconds')
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In [5]:
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