M = 2, n = 1:

Original equation:

$$+3f_{-1}f_0^2 + 3f_{-1}^2 f_1 + 6f_{-2}f_0 f_1 + 6f_{-2}f_{-1}f_2 = 0 \tag{1}$$

Equivalent equation, where $f_{-j} = \overline{f_j}$:

$$3f_0^2\overline{f_1} + 6f_0 f_1\overline{f_2} + 3f_1\overline{f_1}^2 + 6f_2\overline{f_1 f_2} = 0 \tag{2}$$

All possible solutions:

$$\{f_1 : 0\} \tag{3}$$

Time elapsed: 0.7640247344970703 seconds