M = 1, n = 2:

Original equation:

$$+6f_{-1}^2 f_0^2 + 4f_{-1}^3 f_1 = 0 \tag{1}$$

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

$$6f_0^2\overline{f_1}^2 + 4f_1\overline{f_1}^3 = 0 \tag{2}$$

All possible solutions:

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

$$\left\{f_1 : -\frac{\sqrt{6}}{2}\sqrt{-f_0^2}\right\} \tag{4}$$

$$\left\{f_1 : \frac{\sqrt{6}}{2}\sqrt{-f_0^2}\right\} \tag{5}$$

Time elapsed: 1.1875126361846924 seconds