

Mathcad 11.2a

$a := \text{stack}(10 - i, 2 + 3i, 4 - 5i, 6 + 7i)$ sample values same as Luc's, but a0 changed to avoid scientific notation in solutions (lazy eyes)

$$a = \begin{pmatrix} 10 - i \\ 2 + 3j \\ 4 - 5j \\ 6 + 7j \end{pmatrix}$$

$$c(x) := a_0 + a_1 \cdot x + a_2 \cdot x^2 + a_3 \cdot x^3$$

$$c(x) \text{ solve, } x \rightarrow \left[\begin{array}{l} \frac{1}{255} \left[-5329276 + 6489857 \cdot i + 255 \cdot (-186619401 - 1065387768 \cdot i) \right]^{\frac{1}{3}} + \frac{-3886}{85} + \frac{256}{255} \cdot i \\ \frac{-1}{510} \left[-5329276 + 6489857 \cdot i + 255 \cdot (-186619401 - 1065387768 \cdot i) \right]^{\frac{1}{2}} + \frac{1943}{85} - \frac{128}{255} \cdot i + \frac{11}{255} + \frac{58}{255} \cdot i + \frac{1}{2} \cdot i \cdot 3^{\frac{1}{2}} \cdot \frac{1}{255} \left[-5329276 + 6489857 \cdot i + 255 \cdot (-186619401 - 1065387768 \cdot i) \right]^{\frac{1}{2}} + \frac{3886}{85} - \frac{256}{255} \cdot i \\ \frac{-1}{510} \left[-5329276 + 6489857 \cdot i + 255 \cdot (-186619401 - 1065387768 \cdot i) \right]^{\frac{1}{2}} + \frac{1943}{85} - \frac{128}{255} \cdot i + \frac{11}{255} + \frac{58}{255} \cdot i - \frac{1}{2} \cdot i \cdot 3^{\frac{1}{2}} \cdot \frac{1}{255} \left[-5329276 + 6489857 \cdot i + 255 \cdot (-186619401 - 1065387768 \cdot i) \right]^{\frac{1}{2}} + \frac{3886}{85} - \frac{256}{255} \cdot i \end{array} \right]$$

symbolic solution with numeric evaluation

$$\text{solvec} := c(x) \left| \begin{array}{l} \text{solve, } x \\ \text{float, } 8 \end{array} \right. \rightarrow \begin{pmatrix} -.74614417 + .56477174 \cdot i \\ .64721098 + 1.0404228 \cdot i \\ .22834498 - .92284161 \cdot i \end{pmatrix}$$

$$c(x) \left| \begin{array}{l} \text{solve, } x \\ \text{float, } 8 \end{array} \right. \rightarrow \begin{pmatrix} -.74614417 + .56477174 \cdot i \\ .64721098 + 1.0404228 \cdot i \\ .22834498 - .92284161 \cdot i \end{pmatrix}$$

and the numeric polyroots solution

$$\text{polyroots}(a) = \begin{pmatrix} -.746 + 0.565j \\ 0.228 - 0.923j \\ 0.647 + 1.04j \end{pmatrix}$$

$$\xrightarrow{\text{c(solvec)}} \begin{pmatrix} 0 - 0j \\ 0 - 0j \\ 0 - 0j \end{pmatrix} \quad \text{check of that solutions are valid}$$