Exercise 1

$$\begin{cases} (x) = 2x^{4} - 4x^{3} + 3x^{2} + 4x - 3 \\ 8(x) = 8x^{3} - 12x^{2} + 6x + 4 \end{cases}$$

$$\begin{cases} (x) = 8x^{3} - 12x^{2} + 6x + 4 \\ (x) = 9x^{3} + 8(0) = -3 \Rightarrow 8(0) = 4 \end{cases}$$

$$\begin{cases} (x) = 2x^{4} - 4x^{3} + 3x^{2} + 4x - 3 \\ (x) = 8x^{3} - 12x^{2} + 6x + 4 \end{cases}$$

STEP 1

$$\frac{1}{8} = \frac{1}{5} - \frac{1}{5} = -0.0$$

$$\frac{1}{5} = -0.0$$

$$\frac{1}{5} = -0.8$$

$$\frac{1}{5} = -0.8$$

STOPZ

$$X_{2} = X_{1} - \lambda \left\{ (X_{1}) = -\frac{2}{3} + \frac{4}{50} = -\frac{16}{50} = -\frac{3}{25} \right\} = -0.32$$

$$\begin{cases} (X_{2}) = 2(-\frac{3}{25})^{4} - 4(-\frac{3}{25})^{3} + 3(-\frac{3}{25})^{2} + 4(-\frac{3}{25}) - 3 = -\frac{19}{5} = -3.8 \\ (X_{2}) = 8(-\frac{3}{25})^{3} - 12(-\frac{3}{25})^{2} + 6(-\frac{3}{25}) + 4 = \frac{3}{5} = 0.6 \end{cases}$$

$$\chi_{3} = \chi_{2} - d \begin{cases} (\chi_{2}) = -\frac{9}{25} - \frac{3}{50} = -0.38 \\ (\chi_{3}) = 2(-\frac{9}{50})^{6} - 4(-\frac{9}{50})^{3} + 3(-\frac{9}{50})^{2} + 4(-\frac{9}{50}) - 3 = -\frac{19}{50} = -3.8 \\ (\chi_{5}) = 8(-\frac{9}{50})^{3} - 12(-\frac{9}{50})^{2} + 6(-\frac{9}{50}) + 4 = -\frac{9}{20} = -0.45 \end{cases}$$

COMMENT

- · The starting solution is already approximation and with the given loorning reate, at each step i of the algorithm we keep getting almost the same solution for &(x:).
- · With a bit smaker learning reate we can Improve a bit the value of the solution.

