

Assignment-1

J8K4JAD549

$$f(x) = x^4 + 3x^2 + 10$$

$$\longrightarrow \text{At } x=0 \Rightarrow f(x) = 10$$

1) $x=5, \text{ite}=2, \eta=0.01, i=1;$

$$\begin{aligned} 2) \quad \frac{\partial f}{\partial x}(x=5) &= (4x^3 + 6x)_{(x=5)} \\ &= 4(125) + 6(5) \\ &= 530 \end{aligned}$$

$$\begin{aligned} 3) \quad \Delta x &\propto \frac{\partial f}{\partial x} \\ \Delta x &= -\eta \frac{\partial f}{\partial x} = -(0.01)(530) \\ &= -5.3 \end{aligned}$$

$$\begin{aligned} 4) \quad x &= 5 + (-5.3) \\ x &= -0.3 \end{aligned}$$

$$5) \quad i = i + 1 = 1 + 1 = 2$$

$$6) \quad \begin{aligned} \text{ite} &\geq i \\ x &\geq 2 \quad \checkmark \end{aligned}$$

7) go to step 2.

$$\begin{aligned} \longrightarrow 2) \quad \frac{\partial f}{\partial x}(x=-0.3) &= (4x^3 + 6x)_{(x=-0.3)} \\ &= 4(-0.3)^3 + 6(-0.3) \\ &= -1.908 \end{aligned}$$

$$\begin{aligned} 3) \quad \Delta x &= -(0.01)(-1.908) \\ &= +0.01908 \end{aligned}$$

$$4) \quad x = -0.3 + 0.01908 = -0.28092$$

$$5) \quad i = i + 1 = 2 + 1 = 3$$

$$6) \quad 3 \geq 2 \quad \times$$

$$\therefore f(x) = (-0.28)^4 + 3(-0.28)^2 + 10$$