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17/EUG05/044

Mechatronics

m2 2(1,1)

MATHS

ASSIGNMENT 2

$$f(x) = e^{-0.5x}(4-x) - 2 = 4e^{-0.5x} - xe^{-0.5x} - 2$$

$$x = 0.5$$

$$f'(x) = -2e^{-0.5x} - e^{-0.5x} + 0.5xe^{-0.5x}$$

$$x_{i+1} = x_i - \frac{f(x_i)}{f'(x_i)}$$

$$\begin{aligned} x_{i+1} &= 0.5 - \frac{(4e^{-0.5 \times 0.5} - 0.5 \times e^{(-0.5 \times 0.5)} - 2)}{-2e^{-0.5 \times 0.5} - e^{(0.5 \times 0.5)} + 0.5 \times 0.5 e^{-0.5 \times 0.5}} \\ &= 0.5 - \frac{0.725807407}{-2.14170253} = \underline{\underline{0.838890606}} \end{aligned}$$

$$x_{i+1} = 0.838890606 - \frac{0.078149298}{-1.696486032} = \underline{\underline{0.884956}}$$

$$x_{i+1} = 0.884956 - \frac{0.001236575}{-1.643060762} = \underline{\underline{0.885708605}}$$