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16/ENG06/004

MECHANICAL ENGINEERING

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

$$x = 0.5$$

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

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

$$x_{i+1} = 0.5 - \frac{(4e^{-0.5 \times 0.5} - 0.5 \times e^{(-0.5 \times 0.5)} - 2)}{2e^{-0.5 \times 0.5} - e^{(0.5 \times 0.5)} + 0.5 \times 0.5e^{-0.5 \times 0.5}}$$

$$= 0.5 - \frac{0.7258007407}{-2.141702153}$$

$$= 0.838890606$$

$$x_{i+1} = 0.884956 - \frac{0.001236525}{-1.673060762}$$

$$= 0.885708605$$