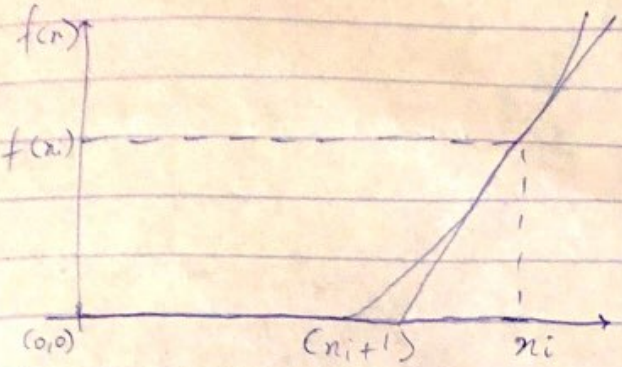
$f(x) = e^{0.5x}(4-x) - 2$




$$f'(x) = \frac{(f(x_i) - 0)}{x_i - (x_{i+1})}$$

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

$$f'(x_i) * (x_{(i)}) - f'(x)(x_{(i+1)}) = f(x_i)$$

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

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

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

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

$f'(x) = -0.5 \times 4(e^{-0.5x}) - (x * (-0.5e^{-0.5x}) + e^{-0.5x} \cdot 1 - 0$

$f'(x) = -0.5 \times 4e^{-0.5x} - (-x\,0.5e^{-0.5x} + e^{-0.5x}) - 0$

$= -2e^{-0.5x} + x\,0.5e^{-0.5x} - e^{-0.5x}$

Therefore if $x_0 = 0.5$ as given

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

when $i = 0$

$$x_{(0+1)} = x_0 - \frac{f(x_0)}{f'(x_0)}$$

$x_0 = 0.5$

$$x_1 = 0.5 - \left(\frac{(e^{-0.5(0.5)}(4 - 0.5) - 2)}{(-2e^{-(0.5 \times 0.5)} + 0.5(0.5e^{-0.5 \times 0.5}) - e^{-0.5(0.5)}}\right)$$

$$x_1 = 0.5 - \left(\frac{0.725803}{2.1417023}\right)$$

$x_1 = 0.5 - (-0.338890)$

$x_1 = 0.83889$

error = $e_a = \frac{x_{(i+1)} - x_i}{x_{(i+1)}}$

where $i = 0$

$e_a = \frac{x_1 - x_0}{x_1}$ $\quad e_a = \frac{0.83889 - 0.5}{0.83889} = 0.40397$

$e_a = 40.397\%$

where $i = 1$ $\quad x_2 = x_1 - \frac{f(x_1)}{f'(x_1)}$ ; $x_2 = 0.83889 - \frac{\left(e^{-(0.83889 \times 0.5}(4 - 0.839 - 2\right)}{-2e^{-(0.5 \times 0.83889)} + (0.83889 \times 0.5 \times e^{-0.5 \times 0.839} - e^{-(0.5 \times 0.83889)}}$

$x_2 = 0.83889 - \left(\frac{0.078150}{-0.16640}\right)$ ; $0.83889 - (-0.046965)$

$0.8858_{//}$

where $i = 1$

error $= \frac{x_2 - x_1}{x_2} = \frac{0.8858 - 0.83889}{0.8858} = 0.05295 \times 100$

$= 5.295\%_{//}$

where $i = 2$

$x_3 = x_2 - \frac{f(x_2)}{f'(x_2)}$ ; $x_3 = \frac{0.8858 - \left(e^{-0.8858}(4 - 0.8858) - 2\right)}{-2e^{-(0.5 \times 0.8858)} + 0.8858 \times 0.5 \times e^{-0.5 \times 0.8858} - (e^{-0.5} \times 0.8858)}$

$x_3 = 0.8858 - \frac{(-0.0001476)}{-1.6426}$ ; $0.8858 + 0.000091075$

$= 0.8858910754$

error $= \frac{x_3 - x_2}{x_3} = \frac{0.885891 - 0.8858}{0.885891} = 0.0001015 = 0.01015 \times 100$

$= 0.01\%_{//}$

where $i = 3$ $\quad x_4 = x_3 - \frac{f(x_3)}{f'(x_3)}$

$x_4 = \frac{0.885891 - \left(e^{-0.885891 \times 0.5} \times (4 - 0.885891) - 2\right)}{-2e^{-(0.5 \times 0.885891)} + (0.885891 \times 0.5 \times e^{-0.5 \times 0.885891}) - e^{-(0.5 \times 0.885}}$

$x_4 = 0.885891$

error $= 0.885891 - 0.885891$

$= 0.885891 - 0.885891$

$= 0\%$