

$$\Sigma_7 = \left| \frac{0.8849559809 - 0.838890606}{0.8849559809} \right| \times 100$$

$$= 0.08497447081$$

$$X_4 = 0.8852086071 - e^{-0.5(0.8857086071)} \frac{(4 - 0.8857086071) - 2}{0.5e^{-0.5(0.8857086071)} (0.8857086072 - 4) - e^{0.5(0.8857086071)}}$$

$$\Sigma_5 = \left| \frac{0.885708802 - 0.885708802}{0.885708802} \right| \times 100 = 2.00497495 \times 10^{-5}$$

$$X_5 = 0.885708802 - e^{-0.5(0.885708802)} \frac{(4 - 0.885708802) - 2}{0.5e^{-0.5(0.885708802)} (0.885708802 - 4) - e^{0.5(0.885708802)}}$$

$$= 0.885708802$$

$$\Sigma_6 = \left| \frac{0.885708802 - 0.885708802}{0.885708802} \right| \times 100$$

= 0

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16/EN4021009

Assignment 2

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

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

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

$$f'(x) = u = e^{-0.5x} \quad v = 4-x$$

$$f'(x) = \frac{dy}{dx} = v \frac{du}{dx} + u \frac{dv}{dx}$$

$$f'(x) = (4-x)(-0.5e^{-0.5x}) + e^{-0.5x}(-1)$$

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

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

i	x	Σa
0	0.5	0
1	0.838890606	40.3974299
2	0.8849559809	5.265386019
3	0.8857086071	0.08497447061
4	0.885708802	

$$x_{1+1} = 0.5 - \frac{e^{-0.5(0.5)} (4-0.5) - 2}{0.5e^{-0.5(0.5)} (0.5-4) - e^{-0.5(0.5)}} = 0.838890606$$

$$\% \text{ Error} = \left| \frac{x_{i+1} - x_i}{x_{i+1}} \right| \cdot 100$$

$$= \left| \frac{0.838890606 - 0.5}{0.838890606} \right| \times 100$$

$$= 40.39747299\%$$

$$x_2 = 0.838890606 - \frac{e^{-0.5(0.838890606)} (4-0.838890606) - 2}{0.5e^{-0.5(0.838890606)} (0.838890606-4) - e^{-0.5(0.838890606)}} = 0.8849559809$$