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16/ENG01/013
Chem. Engr

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

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

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

$$x_{i+1} = x_i - \frac{e^{-0.6x}(4-x) - 2}{0.5e^{-0.6x}(x-4) - e^{0.5x}}$$

| i | $x$ | $E.$ |
|---|-----|------|
| 0 | 0.5 | 0 |
| 1 | 0.838890606 | 40.39747299 |
| 2 | 0.884955980q | 5.205386019 |
| 3 | 0.8857086071 | 0.0849747061 |
| 4 | 0.885708802 | |
| 5 | | |
| 6 | | |
| 7 | | |

$$x_1 = 0.5 - \frac{e^{-0.5(0.5)}(4-0.5) - 2}{0.5e^{-0.5(0.5)}(0.5-4) - e^{-0.5(0.5)}}$$

$$= 0.838890606$$

$$E_a = \left[\frac{x_{i+1} - x_i}{x_{i+1}}\right] \times 100$$

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

$$= 40.39747299$$

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

$$= 0.884955980q$$

$$E_a = \left[\frac{0.884955980q - 0.838890606}{0.8847559804}\right] = 5.205386019$$

$$x_2 = 0.8849559809 - e^{-0.5(0.884955809)} \frac{(4-8849559809)-2}{0.5e^{-0.5(0.8849569809)}(0.884953980\overline{9}-4)-e^{-0.5(0.8849539809)}}$$

$$= 0.8857086071$$

$$E_a = \left[\frac{0.8857086071 - 0.8849559809}{0.8857086071}\right] \times 100$$

$$= 0.08497447061$$

$$x_4 = 0.8857086071 - e^{-0.5(0.8857086071)} \frac{(4-0.8857086071)-2}{0.5e^{-0.5(0.8857086071)}(0.885706071-4)-e^{-0.5(0.8857086071)}}$$

$$= 0.885708802$$

$$E_a = \left[\frac{0.885708802 - 0.885708607_1}{0.885708802}\right] \times 100$$

$$= 2.200497495 \times 10^{8}$$

$$x_5 = 0.885708802 - e^{-0.5(0.885708802)} \frac{(4-0885708802)-2}{0.5e^{-0.5(0.885708802)}(0.885708802-4)-e^{-0.5(0.885708802)}}$$

$$= 0.885708802$$

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

$$= 0$$