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MATRIC NO: 15/ENG04/024

DEPARTMENT: ELECTRICAL/ELECTRONIC ENGINEERING

COURSE: ENG 382

ASSIGNMENT 2

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

i	x	x _{i+1}	% Error
0	0.5	0.5 - $\frac{e^{-0.25}(4-0.5) - 2}{-0.5e^{-0.25}(4-0.5) - e^{-0.25}}$ = 0.8344	100%
1	0.8344	0.8344 - $\frac{e^{-0.4172}(4-0.8344) - 2}{-0.5e^{-0.4172}(4-0.8344) - e^{-0.4172}}$ = 0.8180	60.37%
2	0.8180	0.8180 - $\frac{e^{-0.4090}(4-0.8180) - 2}{-0.5e^{-0.4090}(4-0.8180) - e^{-0.4090}}$ = 0.8150	5.27%
3	0.8150	0.8150 - $\frac{e^{-0.4087}(4-0.8150) - 2}{-0.5e^{-0.4087}(4-0.8150) - e^{-0.4087}}$ = 0.8157	0.07%
4	0.8157	0.8157	0%
5	0.8157	0.8157	0%

$$2 \quad F_p = \frac{0.3V^3}{500 + (\ln V)^2} - 0.02V$$

$$F_p = mg$$

$$m = 3.5 \text{ kg}$$

$$g = 9.8 \text{ m/s}^2$$

$$F_p = 9.8 \times 3.5$$

$$= 34.3 \text{ N}$$

$$34.3 = \frac{0.3V^3}{500 + (\ln V)^2} - 0.02V$$

$$0 = \frac{0.3V^3}{500 + (\ln V)^2} - 0.02V - 34.3$$

Let $f(V)$ be the LHS

$$f(V) = \frac{0.3V^3}{500 + (\ln V)^2} - 0.02V - 34.3$$

Differentiating w.r.t V

$$f'(V) = \frac{300V - \ln V^3(0.3V) - 0.9V(\ln V)^2}{500^2 + \ln V^4} - 0.02$$

$$V_c + 1 = V_c - \frac{f(V)}{f'(V)}$$

$$\therefore V_c + 1 = V_c - \frac{0.3V^3 - 0.02V - 34.3}{\frac{300V + \ln V^3(0.3V) - 0.9V(\ln V)^2 - 0.02}{500^2 + \ln V^4}}$$