Math Assignment LMS

Assignment 1

17/ENG04/087

Elect/Elect

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Given $f_D = \dfrac{0.3v^2}{500 + (\ln v)^3} - 0.02v$

At terminal Velocity

$f_D = mg$

$\therefore mg = \dfrac{0.3v^2}{500 + (\ln v)^3} - 0.02v$

$\dfrac{0.3v^2}{500 + (\ln v)^3} = mg + 0.02v$

$0.3v^2 = (500 + [\ln v]^3)(mg + 0.02v)$

$v^2 = \dfrac{(500 + [\ln v]^3)(mg + 0.02v)}{0.3}$

$v^2 = \sqrt{\dfrac{(500 + [\ln v]^3)(mg + 0.02v)}{0.3}}$

where $m \longrightarrow 8.5$ kg

$g \longrightarrow 9.8$ m/s

$$\therefore U = \sqrt{\dfrac{(500 + [\ln U]^3)(3.5 \times 9.8 + 0.2)}{0.3}}$$

$$U = \sqrt{\dfrac{(500 + [\ln U]^3)(34.3 + 0.2U)}{0.3}}$$

given $U_0 = 0.5$

Mathab Code:-

i.) - Command Window

- Clear
- clc
- Clear all
- format long g.
- $U = 0.5$
- for i = 100
- iter $(i+1) = i$;
- $U(i+1) = sqrt([(500 + (log(U(i)))^3) * (34.3 + (0.2 * U(2))))] / 0.3)$
- $ea(i+1) = abs(((U(i+1) - U(i)) / U(i+1)) * 100)$;
- if $ea(i+1) <= 12.11$
- break
-        end
- end

- [iter 'u' 'ea']

- plot (u, iter)

- axistight

- grid on

- grid minor

Ans: 304.0678322850083.