

ASSIGNMENT I

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 MECHANICAL ENGINEERING
 16/ENG06/059
 ENG382

$$F_D = \frac{0.3V^2}{500 + (10V)^3} - 0.02V \quad (1)$$

$$F_D = Mg = 3.5 \times 9.8 = 34.3 \quad (2)$$

Equating eqn 1 and 2

$$Mg = 34.3 = \frac{0.3V^2}{500 + (10V)^3} - 0.02V$$

Making V^2 subject of formula

$$34.3 + 0.02V = \frac{0.3V^2}{500 + (10V)^3}$$

$$0.3V^2 = (34.3 + 0.02V) * (500 + (10V)^3)$$

$$V^2 = (34.3 + 0.02V) * (500 + (10V)^3) / 0.3$$

$$V = \sqrt{(34.3 + 0.02V) * (500 + (10V)^3) / 0.3}$$

Initial guess Value = $V_0 = 0.5$ m/s

Absolute % relative error $E_r(T+1) < 1E-11$

MATLAB CODES

Command Window

Clear

Clc

Close all

Syms v

v = 0.5

T = 1; bp

$$v(T+1) = ((34.3 + 0.02 * v(T)) * (500 + (10 * v(T))^3)) / 0.3$$