

TGBOEKWE KENENNA

16/ENG03/031

CIVIL ENGINEERING

ENG 382

Assignment 1

Solution

$$F_s = \frac{0.3v^2}{500 + (1nv)^3} - 0.02v \quad \text{--- ①}$$

$$F_s = Mg = 3.5 \times 9.8 = 34.3 \quad \text{--- ②}$$

Equating eqns ① and ②

$$Mg = 34.3 = \frac{0.3v^2}{500 + (1nv)^3} - 0.02v$$

Making v the subject of the formula

$$34.3 + 0.02v = \frac{0.3v^2}{500 + (1nv)^3}$$

$$0.3v^2 = (34.4 + 0.02v) * (500 + (1nv)^3)$$

$$v^2 = \frac{((34.4 + 0.02v) * (500 + (1nv)^3))}{0.3}$$

$$v = \sqrt{\frac{((34.4 + 0.02v) * (500 + (1nv)^3))}{0.3}}$$

Recall! From the question

Initial guess value : $v_0 = 0.5 \text{ m/s}$

Absolute % relative error $E_a(i+1) \leq 1\%$