

Answer

$$F_0 = \frac{0.3V^2}{500 + (1nv)^3} - 0.02V \quad \text{--- (1)}$$

$$F_0 = Mg = 35 \times 9.8 = 34.3 \quad \text{--- (2)}$$

Equating eqn 1 & 2

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

Making V^2 subject of formula

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

$$0.3V^2 = (34.3 + 0.02V) * (500 + (1nv)^3)$$

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

$$V = \sqrt{(34.3 + 0.02V) * (500 + (1nv)^3) / 0.3}$$

Initial guess value $\rightarrow V_0 = 0.5 \text{ m s}^{-1}$

Absolute % relative error, Eq (1) $\leq 1E-11$