

Name: Joshua N. Bok

Dept: Mechatronics Engr.

Mat No: 16/ENG05 016

Course: ENG 382 - Eng. Maths IV

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

where, $P_D = mg$
 $m = 3.5K$
 $g = 9.8m/s$

soln

$$P_D = mg = 3.5 \times 9.8 = 34.3$$

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

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

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

$$(34.3 + 0.02V)(500 + (\ln V)^3) = 0.3V^2$$

$$17150 + 34.3(\ln V)^3 + 10V + 0.02V(\ln V)^3 = 0.3V^2$$

$$V^2 = \frac{17150 + 10V + (34.3 + 0.02V)(\ln V)^3}{0.3}$$

$$V = \sqrt{57166.67 + 33.33V + (114.33 + 0.067)(\ln V)^3}$$