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1216ENG06 1055
Mechanical Engineering
ENG 382 Assignment 1

Solution

```
Command window
clear
clc
format short
V = 0.5
m = 3.5
g = 9.8
f = m * g
V = sqrt (((((f + (0.02 * V)) * (log(V)^3)) + (w * V) + 17480) / 0.3);
For i = 1: Inf
V(i+1) = sqrt (((( F + (0.02 * v(i))) * (log( v(i)))^3) + (w * v(i)) +
                                                    17180 / 0.3);
Ea(i+1) = abs [( (V(i+1) - v(i)) / V(i+1)) * 100);
If Ea(i+1) <= 1E-11
break
end
end
table2 table(iter', V', Ea')
```

Converging at iter = 7 ; V = 304.07 E_a = 0.0012941

Prove:

$$F_D = \frac{0.3V^2}{500 + (\ln V)^2} - 0.02V \quad \text{——— (1)}$$

If V = 304.07

Recall $f_D = Mg = 3.5 \times 9.8 = 34.30$

Substituting V = 304.07 into eqn 1

$$f_D = \frac{0.3\,(304.07)^2}{500 + (\ln(304.07))^2} - 0.02(304.07)$$

f_D = 40.3882 − 6.0814

= 34.30