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17/ENG06/028
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(w)^3) + (10*v)+ 17150)/0.3);
Ea(i+1)= abs (((v(i+1) - v(i))/ v(i+1))* 100);
 if Ea(i+1) <= 1E-4
    break
 end
end
table = table (iter,'v','Ea')
```

OUTPUT

iter	v	Ea
	0.5	
0	~~304.06~~	0
1	~~28~~9.05	99.791
2	294.17	18.736
3	302.61	2.7894
4	303.85	0.40992
5	304.04	0.060144
6	304.06	0.0088222
7	304.07	0.0012941

8	304.07	0.00018981
9	304.07	2.7842 e-05
10	304.07	4.0838e-06
11	304.07	8.7865e-08
12	304.07	1.2888e-08
13	304.07	1.8904e-09
14	304.07	2.7727e-10
15	304.07	4.0679e-11
16	304.07	5.9635e-12

Converging at iter = 7, v = 304.07

Prove

$$f_n = \frac{0.3v^2}{500 + (\ln v)^3} \qquad 0.02v$$

If $v = 304.07$

Recall $F_D = 98 \times 35 = 34.30$

Substituting $v = 304.07$

$$F_D = \frac{0.3 \times (304.07)^2}{500 + (\ln(304.07))^3} = 0.02(304.07)$$

$F_D = 40.38195931 - 6.0814$

$F_D = 34.3$