Adesegun Oredunun Ayompos: 17/ENG06/1004

Mechanical Eng.

ENG 382 ASSIGNMENT

```
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))+(10*v)+17150)/0.3)-
For i=1:ns
iter(i+1)=i
v(i+1)=sqrt((((F+(0.02*v(i)))*(log(v(i)))^3)+(10*v(i))+17150/0.3);
Ea(i+1)=abs(((v(i+1)-v(i))/v(i+1))*100);
if Ea(i+1)<=1E-11
break
end
end
Table=table(iter',v',Ea')
```

OUTPUT

iter	v	Ea
0	0.5	0
1	239.05	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	304.06	0.00018781
9	304.07	$2.784e^{-05}$
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	$2.827e^{-10}$
15	304.07	$4.0679e^{-11}$
16	304.07	$5.9635e^{-12}$

Converging at iter = 7, $V = 304.07$

Prove

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

If $V = 304.07$

Recall

$$F_b = 9.8 \times 3.5 = 34.30$$

substituting $V = 304.07$

$$F_b = \frac{0.3(304.07)^2}{500\pi(\ln 304.07)^3} - 0.02(304.07)$$

$$F_b = 40.38195931 - 6.0814$$

$$F_b = 34.3$$