OJEIKERE OHIKHATEEME

17/ENG02/061

Elect/Elect

Command window

```
clear
cle
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:inf
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	E_a
0	0.5	0
1	239.05	99.791
2	294.17	18.736
3	302.61	2.7894
4	303.85	0.40792
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	4.0838 e-06
11	304.07	8.7865 e-08
12	304.07	1.2888 e-08
13	304.07	1.8904 e-09
14	304.07	2.7727 e-10
15	304.07	4.0679 e-11
16	304.07	5.9635 e-12

Converging at iter = 7

V = 304.07

Prove

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

If V = 304.07

Recall $f_D = 9.8 \times 3.5 = 34.30$

Substituting V = 304.07

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

$$F_D = 40.381959 - 6.0814$$

$$F_D = 34.3.$$