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17/ENG04/029
Elect
ENG 382 Assignment 1

Command window

```
clear
clc
format short
V = 0.5
m = 3.5
q = 9.8
F = m * 9
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*Vci)))*(log(Vci)))^3) + (10*Vci))
        + 17150/0.3);
  Ea(i+1) = abs(((Vci+1) - Vci))/Vci+1))*100);
  if Ea(i+1) <= 1E-11
  break
  end
  end
  table = table(iter', v', Ea')
```

~~Output~~

~~0~~	~~V~~	~~Ea~~
~~1~~	~~0.5~~	~~0~~
~~2~~	~~239.05~~	~~99.791~~
~~3~~	~~294.17~~	~~18.736~~
4	302.61	
5	3	

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

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6	304.06	0.0088222
7	304.07	0.0012941
8	304.07	0.00018981
9	304.07	2.7842e−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−60
15	304.07	4.0679e−11
16	304.07	5.9635e−12

Converging of 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

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

$$F_D = 40.38195931 - 6.0814$$

$$F_D = 34.3$$

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