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17/ENG08/034
Mechanical Engineering
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: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	Ea
0	05	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	0.0082822
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	$2.7727e^{-10}$
15	304.07	$4.0679e^{-11}$
16	304.07	$5.9635e^{-12}$

Converging at iter = 7 ; V = 304.07.

Proven.

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

0.02V.

if V = 304.07

Recall

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

$F_D = 40.38195931 - 600814$

$F_D = 34.3$